HFES
Systems That Work for Humans

HFES 64TH INTERNATIONAL ANNUAL MEETING

OCTOBER 5-9, 2020 | VIRTUAL CONFERENCE

PROGRAM **COMMITTEES**

VIRTUAL CONFERENCE STEERING COMMITTEE

Kermit Davis
University of Cincinnati

Susan Hallbeck
Mayo Clinic

Susan Kotowski
University of Cincinnati

Camille Peres
Texas A&M University

Anthony Andre
Interface Analysis Associates

Ron Boring
Idaho National Laboratory

TECHNICAL PROGRAM COMMITTEE

Program Chair – Ron Boring
Idaho National Laboratory

Anne Adams
Atlanta, GA

Cheryl Bolstad
Sandia National Laboratories

Joel Cort
University of Windsor

Tarah Daly (Schmidt)
Cognitive Performance Group

Sandra Garrett
Touchstone Evaluations, Inc.

Susan Hallbeck
Mayo Clinic

France Jackson
University of Florida

Nicholas Kelling
University of Houston, Clear Lake

Roger Lew
University of Idaho

Avi Parush
Israel Institute of Technology

Pamela Savage-Knepshield
Combat Capabilities Development Command, Data Analysis Center

Tonya Smith-Jackson
North Carolina A&T State University

Xidong Xu
The Boeing Company

TECHNICAL GROUP PROGRAM CHAIRS

Igor Dolgov
Aerospace Systems

Marita O'Brien
Aging

Brett Borgetti
Aging

Carol Pollack-Nelson
Children's Issues

Heather Lum
Cognitive Engineering & DM

Aaron Bangor
Communications

Jay Elkerton
Computer Systems

Robert Gutzwiller
Cybersecurity

Nicholas Kelling
Education

Karen Jabobs
Environmental Design

Alison Vredenburgh
Forensics Professional

Farzan Sasangohar
Health Care

Esa Rantanen
Human Performance Modeling

James Szalma
Individual Differences

Lexi Neigel, Co-chair
Individual Differences

Juan Gilbert
Internet

Rupa Valdez
Macroergonomics

Ranjana Mehta
Occupational Ergonomics

Erin Alves
Perception & Performance

Dan Odell
Product Design

Tamsyn Edwards
Safety

Yi Glaser
Surface Transportation

Frank Lacson
System Development

Michelle Bryant
Training

Heather Wojton
Usability and System Evaluation

Laura Strater
Virtual Environments

HUMAN FACTORS AND ERGONOMICS SOCIETY OFFICERS

President, M. Susan Hallbeck, Mayo Clinic

President-Elect, Peter Hancock, University of Central Florida

Immediate Past President, Kermit G. Davis

Secretary-Treasurer, Caroline G. L. Cao, Wright State University

Immediate Past Secretary-Treasurer, Christopher R. Reid, The Boeing Company

Secretary-Treasurer-Elect, Susan Kotowski, University of Cincinnati

EXECUTIVE COUNCIL AT LARGE MEMBERS

Thomas J. Albin, High Plains Engineering Services, LLC

Ellen Bass, Drexel University

Paul A. Green, University of Michigan

Rebecca Grier

Richard J. Holden, Indiana University

Nancy L. J. Larson, Nancy LJ Larson Consulting, LLC

HUMAN FACTORS AND ERGONOMICS SOCIETY DIVISION CHAIRS

Education Division, Barbara Chaparro, Embry-Riddle Aeronautical University

Internal Affairs Division, Rupa Valdez, University of Virginia

Outreach Division, Karen Jacobs, Boston University

Scientific Publications Division, Bill J. Horrey, AAA Foundation for Traffic Safety

Technical Standards Division, Robert Fox, General Motors Corporation

2020 **SPONSORS**

MAYO CLINIC

BOARD OF CERTIFICATION IN PROFESSIONAL ERGONOMICS

BCPE

2020 **EXHIBITORS**

fieldWORK

human reliability

HFE in the Connected World

L'ergonomie 4.0

IEA VANCOUVER 2021

SAGE Publishing

TEA

tobii pro

XSENS

SCHEDULE **AT A GLANCE**

MONDAY, OCTOBER 5, 2020	
7:00 AM - 8:00 AM PDT 9:00 AM - 10:00 AM CDT 10:00 AM - 11:00 AM EDT	Opening Coffee Network
8:00 AM - 9:30 AM PDT 10:00 AM - 11:30 AM CDT 11:00 AM - 12:30 PM EDT	Opening Plenary Session Opening Keynote, Dr. Lorrie Cranor, Carnegie Mellon University President's Remarks Presentation of Society Awards
9:30 AM - 12:00 PM PDT 11:30 AM - 2:00 PM CDT 12:30 PM - 3:00 PM EDT	"Break/Meet With Exhibitors Find Your People: Affinity Groups and TGs
12:00 PM - 1:30 PM PDT 2:00 PM - 3:30 PM CDT 3:00 PM - 3:30 PM EDT	Educational Sessions
1:30 PM - 2:00 PM PDT 3:30 PM - 4:00 PM CDT 4:30 PM - 5:00 PM EDT	Break/Meet With Exhibitors Meditation/Mindfullness Translating our science: Academics and Practitoners Meet
2:00 PM - 3:30 PM PDT 4:00 PM - 5:30 PM CDT 5:00 PM - 6:30 PM EDT	Educational Sessions
3:30 PM - 4:30 PM PDT 5:30 PM - 6:30 PM CDT 6:30 PM - 7:30 PM EDT	Presenter Chat and Happy Hour Beer & Mixology Tea Tasting
TUESDAY, OCTOBER 6, 2020	
7:00 AM - 8:00 AM PDT 9:00 AM - 10:00 AM CDT 10:00 AM - 11:00 AM EDT	Opening Coffee Network/Meet with Exhibitors
8:00 AM - 9:30 AM PDT 12:00 PM - 1:30 PM CDT 1:00 PM - 2:30 PM EDT	Educational Sessions
11:30 AM - 12:00 PM PDT 1:30 PM - 2:00 PM CDT 2:30 PM - 3:00 PM ED	Break/Meet with Exhibitors Virtual Photo Booth and Social Networking Learning the Ladder: Early Career and Mid-Career Talk about the Climb
12:00 PM - 1:30 PM PDT 2:00 PM - 3:30 PM CDT 3:00 PM - 4:30 PM EDT	Educational Sessions

TUESDAY, OCTOBER 6, 2020 *(CONTINUED)*	
1:30 PM - 2:00 PM PDT 3:30 PM - 4:00 PM CDT 4:30 PM - 5:00 PM EDT	Break/Meet with Exhibitors Meditation and Mindfullness Learning the Ladder: Early Career and Mid-Career Talk about the Climb
2:00 PM - 3:30 PM PDT 4:00 PM- 5:30 PM CDT 5:00 PM - 6:30 PM EDT	Educational Sessions
3:30 PM - 4:30 PM PDT 5:30 PM - 6:30 PM CDT 6:30 PM - 7:00 PM EDT	Presenter Chat and Happy Hour University Get Togethers Local Chapters Get Togethers
4:00 PM - 5:00 PM PDT 6:00 PM - 7:00 PM CDT 7:00 PM - 8:00 PM EDT	HFES Annual Business Meeting
WEDNESDAY, OCTOBER 7, 2020	
7:00 AM - 10:00 AM PDT 9:00 AM - 12:00 PM CDT 10:00 AM - 1:00 PM EDT	Opening Coffee Network
8:00 AM - 9:30 AM PDT 12:00 PM - 1:30 PM CDT 1:00 PM - 2:30 PM EDT	Educational Sessions
11:30 AM - 12:00 PM PDT 1:30 PM - 2:00 PM CDT 2:30 PM - 3:00 PM EDT	Break/Meet with Exhibitors Meet the Leadership - Masked Fellows: Who Are They? Meet the Leadership - Coffee with the Presidents (Past, Current, Future)
12:00 PM - 1:30 PM PDT 2:00 PM - 3:30 PM CDT 3:00 PM - 4:30 PM EDT	Educational Sessions
1:30 PM - 2:00 PM PDT 3:30 PM - 4:00 PM CDT 4:30 PM - 5:00 PM EDT	Break/Meet with Exhibitors Meditation/Mindfullness Meet the Leadership - TG Leadership
2:00 PM - 3:30 PM PDT 4:00 PM- 5:30 PM CDT 5:00 PM - 6:30 PM EDT	Poster Session
3:30 PM - 4:30 PM PDT 5:30 PM - 6:30 PM CDT 6:30 PM - 7:30 PM EDT	Presenter Chat and Happy Hour Cooking Demo Chocolate Tasting

SCHEDULE **AT A GLANCE**

THURSDAY, OCTOBER 8, 2020	
7:00 AM - 10:00 AM PDT 9:00 AM - 12:00 PM CDT 10:00 AM - 1:00 PM EDT	Opening Coffee Network
8:00 AM - 9:30 AM PDT 12:00 PM - 1:30 PM CDT 1:00 PM - 2:30 PM EDT	Educational Sessions
11:30 AM - 12:00 PM PDT 1:30 PM - 2:00 PM CDT 2:30 PM - 3:00 PM EDT	Break/Meet with Exhibitors Virtual Photo Booth and Social Networking Translating our Science: Academics and Practitioners Meet
12:00 PM - 1:30 PM PDT 2:00 PM - 3:30 PM CDT 3:00 PM - 4:30 PM EDT	Educational Sessions
1:30 PM - 2:00 PM PDT 3:30 PM - 4:00 PM CDT 4:30 PM - 5:00 PM EDT	Break/Meet with Exhibitors Meditation/Mindfullness Lewis Burke/Mica: Government Relations
2:00 PM - 3:30 PM PDT 4:00 PM- 5:30 PM CDT 5:00 PM - 6:30 PM EDT	Educational Sessions
3:30 PM - 4:30 PM PDT 5:30 PM - 6:30 PM CDT 6:30 PM - 7:30 PM EDT	Presenter Chat and Happy Hour Game Night Wine Night

FRIDAY, OCTOBER 9, 2020	
7:00 AM - 10:00 AM PDT 9:00 AM - 12:00 PM CDT 10:00 AM - 1:00 PM EDT	Opening Coffee Network
8:00 AM - 9:30 AM PDT 12:00 PM - 1:30 PM CDT 1:00 PM - 2:30 PM EDT	Educational Sessions
11:30 AM - 12:00 PM PDT 1:30 PM - 2:00 PM CDT 2:30 PM - 3:00 PM EDT	Break/Meet with Exhibitors Practitioners' Chat Academics' Chat
12:00 PM - 1:30 PM PDT 2:00 PM - 3:30 PM CDT 3:00 PM - 4:30 PM EDT	Educational Sessions
1:30 PM - 2:00 PM PDT 3:30 PM - 4:00 PM CDT 4:30 PM - 5:00 PM EDT	Break/Meet with Exhibitors Meditation/Mindfullness Learning the Ladder: Mid-Career and Fellows Talk about the Climb
2:00 PM - 3:30 PM PDT 4:00 PM- 5:30 PM CDT 5:00 PM - 6:30 PM EDT	Educational Sessions

THURSDAY, OCTOBER 1, 2020 / 10:00 AM - 11:30 AM CENTRAL TIME

SESSION DETAILS

TRACK: Student Forum
SESSION: SF1: Design & Its Influence on Behavior
SESSION TYPE: Lecture
CHAIRS: Pamela Savage-Knepshield, Army Futures Command, CCDC DAC

Shining Light on Retroreflectivity: Perceived Brightness of Surfaces with Varying Reflective Properties Savana King, Clemson University | Ellen Szubski, Clemson University | Richard Tyrrell, Clemson University

Does Long-Term Exposure To Robots Affect Mind Perception? An Exploratory Study
Min Ji Kim, George Mason University | Spencer C. Kohn, George Mason University | Tyler Shaw, George Mason University |

Effect of Texture on Perception of Axis of Rotation of Pivot Doors;
Balagopal Raveendranath, Clemson University | Christopher Pagano, Clemson University |

Investigating User Perceptions and Stereotypic Responses to Gender and Age of Voice Assistants
Heather Watkins, Clemson University | Richard Pak, Clemson University

The Impact of Automation Etiquette on User Performance and Trust in Non-Personified Technology
Zachary J. Guyton, Clemson University | Richard Pak, Clemson University

TRACK: Student Forum
SESSION: SF2: Improving Usability through Testing & Design
SESSION TYPE: Lecture
CHAIRS: David Azari, US Army

Comparison of SAGAT and SPAM For Seeking Effective Way to Evaluate Situation Awareness and Workload During Air Traffic Control Task
Mitsuki Fujino, University of Tsukuba | Jieun Lee, University of Tsukuba | Toshiaki Hirano, University of Tsukuba | Yuichi Saito, University of Tsukuba | Makato Itoh, University of Tsukuba

Anthropometric Analysis of External Acoustic Meatus for Ergonomic Design
Hao Fan, Northwestern Polytechnical University | Mengcheng Wang, University of California, Berkeley | Carisa Harris-Adamson, University of California, Berkeley | Yihui Ren Northwestern Polytechnic University | Suihuai Yu, Northwestern Polytechnical University |

Metrics of Comfort: Development of Physiological Correlates to Subjective Responses
Mitchell McDonald, North Carolina State University | Anne C. McLaughlin, NCSU |

Blink Rate as a Measure of Driver Workload during Simulated Driving
Sarah Yahoodik, Old Dominion University | Hesamoddin Tahmi, Old Dominion University | James Unverricht, Old Dominion University | Yusuke Yamani, Old Dominion University | Holly Handley, Old Dominion University | Deborah Thompson, Volvo Group |

Empirically and Theoretically Driven Scales on Automation Trust: A Multi-Level Confirmatory Factor Analysis
Shelby Long, Old Dominion University | Tetsuya Sato, Old Dominion University | Nick Millner, Old Dominion University | Ray Loranger, Old Dominion University | Julianna Mirabelli, Old Dominion University | Violet Xu, Old Dominion University | Yusuke Yamani, Old Dominion University |

PROGRAM **AGENDA**

THURSDAY, OCTOBER 1, 2020 / 12:00 PM - 1:30 PM CENTRAL TIME

SESSION DETAILS

SF3: UNDERSTANDING USER NEEDS & BEHAVIOR
TRACK: Student Forum
SESSION TYPE: Lecture
CHAIRS: Pamela Savage-Knepshield, Army Futures Command, CCDC DAC

An Investigation of the Usability of a Teleconsent System
Amal Ponathil, Clemson University | Aasish Bhanu, Clemson University | Hunter Rogers, Clemson University | Mackenzie Wilson, Clemson University | Kapil Chalil Madathil, Clemson University

Examining Frustration and Performance when Priming User Expectations and Providing a Technology Malfunction
Nina R. Ferreri, North Carolina State University | Christopher Mayhorn, North Carolina State University |

Attention and Threat Detection: Warnings and How They Affect Takeover Performance
Emily Brunsen, North Carolina State University | Anne C. McLaughlin, NCSU | Jing Feng, NCSU |

Improving Weather Display Interpretation: A Training Solution
John Kleber, Embry-Riddle Aeronautical University | Jaqueline McSorley, Embry-Riddle Aeronautical University | Jayde King, Embry-Riddle Aeronautical University | Elizabeth Blickensderfer, Embry-Riddle Aeronautical University

Gamification Theory: Implications for General Aviation Weather Training
Jacqueline McSorley, Embry-Riddle Aeronautical University | John Kleber, Embry-Riddle Aeronautical University | Elizabeth Blickensderfer, Embry-Riddle Aeronautical University

SF4: EVALUATING DESIGN & HUMAN PERFORMANCE
TRACK: Student Forum
SESSION TYPE: Lecture
CHAIRS: TBD

Designing an Emergency Management Simulation Testbed to Investigate Incident Management Team Performance
Changwon Son, Texas A&M University | Farzan Sasangohar, Texas A&M University | S. Camille Peres, Texas A&M University | Jukrin Moon, Texas A&M University |

The Effects of Security Framing, Time Pressure, and Brand Familiarity on Risky Mobile Application Downloads
Cody Parker, Old Dominion | Jing Chen, Old Dominion University |

Does the Presence of Biological Motion Facilitate Time-to-Contact Estimations?
Ellen C. Szubski, Clemson University | Savana King, Clemson University | Richard A. Tyrrell, Clemson University |

A Preliminary Study of Elements Impacting the Choice of an Online Contractor
Amal Ponathil, Clemson University | Aashish Bhanu, Clemson University | Kalyan Piratla, Clemson University | Vivek Sharma, Clemson University | Kapil Chalil Madathil, Clemson University |

The Relation of the Perceptions of Aesthetics and Usability
Dahlia Alharoon, North Carolina State University | Douglas J. Gillan, North Carolina State University |

THURSDAY, OCTOBER 1, 2020 / 2:00 PM - 3:30 PM CENTRAL TIME

SESSION DETAILS

SF5: INVESTIGATING FACTORS THAT IMPACT HUMAN BEHAVIOR, DECISION-MAKING AND PERFORMANCE
TRACK: Student Forum
SESSION TYPE: Lecture
CHAIRS: Pamela Savage-Knepshield, Army Futures Command, CCDC DAC

Understanding the Barriers and Facilitators Associated with the Implementation of Continuous Virtual Monitoring System for Fall Risk Reduction in a Tertiary Healthcare System
Sarvesh Sawant, Clemson University | Bhargav V. Upadhyay, Clemson University | Kapil Chalil Madathil, Clemson University | James McElligot, Medical University of South Carolina

Effects of Comments and Profile Pictures on Impression Formation: An Empirical Study on Online Healthcare Peer-Support Portals
Shraddhaa Narasimha, Clemson University | Kapil Chalil Madathil, Clemson University |

The Impacts of Sleep Deprivation on Medical Residents: A Scoping Review of Literature
Anthony Mulenga, Texas A&M University | Farzan Sasangohar, Texas A&M University | Sudeep Hegde, Texas A&M University |

Influences of Stress on Interactions with Decision Support
Kylie Litaker, North Carolina State University | Christopher Mayhorn, North Carolina State University |

Dynamic Information Needs Analysis: Understanding User Information Needs in Subterranean Warfare
Maj Farakh Zaman, United States Air Force/Tufts University | Jason Rife, Tufts University | Daniel Hannon, Tufts University | James Intriligator, Tufts

PROGRAM **AGENDA**

MONDAY, OCTOBER 5, 2020 / 2:00 PM - 3:30 PM CENTRAL TIME

SESSION DETAILS

A1: TECHNOLOGY AND ASSESSMENT OF OLDER ADULTS
TRACK: Aging
SESSION TYPE: Lecture
CHAIR: HeeSun Choi, Texas Tech University
CO-CHAIR: Brandon Kolarik, Exponent, Inc.

A Person-Centered Design Framework for Serious Games for Dementia
Bella (Yigong) Zhang, University of Toronto | Mark Chignell, University of Toronto |

A Systematic Review of Human Factors Literature About Voice User Interfaces and Older Adults
Brodrick Stigall, Clemson University | Kelly Caine, Clemson University |

Tracking Cognitive Decline with a Serious Game: Benchmarking Against the Mini-Mental State Examination
Tiffany K. Tong, University of Toronto | Jacqueline Urakami, Tokyo Institute of Technology | Mary Catherine Tierney, Family & Community Medicine, University of Toronto | Mark Chignell, University of Toronto | Jacques S. Lee, Sunnybrook |

Use of Linear-Polarization Doppler Radar System to Detect Falls: Results from a Simulated Living Environment
Sunwook Kim, Virginia Tech | Maury Nussbaum, Virginia Tech | Fleming Lure, MS Technologies Corp |

CS1: APPLYING DESIGN THINKING: TALES FROM THE FIELD
TRACK: Computers Systems
SESSION TYPE: Discussion Panel
CHAIR: See virtual meeting platform for Chair information

Scott Confer, Infosys | Sanjay Batra, Google | Hugues Belanger, 1904labs |

DEMO: DEMONSTRATIONS
TRACK: Demonstration
SESSION TYPE: TBD
CHAIR: Roger Lew, University of Idaho

Demonstration: Virtual Patient Immersive Trainer to Train Perceptual Skills using Augmented Reality
Christen Sushereba, Unveil, LLC | Laura Militello, Applied Decision Science, LLC |

Effects of Visual Location of Information on the Performance of Monitoring Task Searching in Digital Interactive Interface
Xiaoli Wu, Nanjing University of Science & Technology | Qizhi Li, Hohai University |

Tools for Ergonomic Intervention: The Development and Analysis of a Cost Calculator
Derek Stephens, Ohio University | Diana Schwerha, Ohio University |

MONDAY, OCTOBER 5, 2020 / 2:00 PM - 3:30 PM CENTRAL TIME

SESSION DETAILS

F1: FORENSICS PROFESSIONAL
Track: Forensics Professional
Session Type: Lecture
Chair: See virtual meeting platform for Chair information
Co-Chair: See virtual meeting platform for Chair information

A Case Study Demonstrating the Utility of Surveillance Video in Assessing Gait Dynamics and Behavior During a Slip and Fall
Leah Hartman, Applied Building Sciences, Inc. | Stephanie Whetsel Borzendowski, Applied Building Sciences, Inc. | Alan Campbell, Applied Building Sciences, Inc.

A Potential Case of Inattentional Blindness in a Police-Pursuit Collision
Jeffrey Martin, DSI Consulting |

An Eye Tracking-based Forensic Analysis of Motorcyclist Conspicuity during a Left Turn Maneuver
Stephanie Whetsel Borzendowski, Applied Building Sciences, Inc. | Leah Hartman, Applied Building Sciences, Inc. | Alan Campbell, Applied Building Sciences, Inc. |

Face Validity of Various Display Methodologies in Conveying Spatial Awareness and Depth Perception
Rosemarie Figueroa-Jacinto, Explico Engineering | Elizabeth Kappler, Explico Engineering | Xiaojian Jin, Purdue University | Steve Arndt, Explico Engineering | Steve Rundell, Explico Engineering |

Human Factors Analysis of a Rotating Restaurant
Alison Vredenburgh, Vredenburgh & Associates, Inc. | Michael Vredenburgh, Vredenburgh & Associates, Inc. |

GS1: MEDIA AND PUBLIC ENGAGEMENT FOR SOCIETAL IMPACT: GETTING THE WORD OUT ABOUT HUMAN FACTORS AND ERGONOMICS
Track: General Sessions
Session Type: Discussion Panel

Rod Roscoe, Arizona State University | Claudia Acemyan, Rice University, Karen Jacobs, Brown University; Michelle Robertson, Northeastern University; Angela Yoo, Georgia Institute of Technology; Doug Mitchell, Next Generation Radio

ST1: INNOVATIVE AND ADVANCED METHODS
Track: Surface Transportation
Session Type: Lecture
Chair: Anthony McDonald, Texas A&M
Co-Chair: Iiona Scully, Exponent, Inc.

Comparing the Importance of the Factors on Drivers' Response Time to Lead Vehicle's Braking
Brian Lin, University of Michigan | Dillon Funkhouser, University of Michigan | James Sayer, University of Michigan | Rini Sherony, Toyota Motor North America |

Crash Tags: Topic Modeling Social Media Data after Fatal Automated Vehicle Cacrashes
Ran Wei, Texas A&M University | Hananeh Alambeigi, Texas A&M University | Anthony McDonald, Texas A&M

Driving in the Dust: Challenges and Lessons Learned from Field Testing in Degraded Visual Environments
Kayla Riegner, Ground Vehicle System Center | Kelly Steelman, Michigan Technological University |

Participatory Design in the Classroom: Exploring the Design of an Autonomous Vehicle Human-Machine Interface with a Visually Impaired Co-Designer
Earl Huff, Clemson University | Katie Lucaites, Clemson University | Aminah Roberts, Clemson University | Julian Brinkley, Clemson University |

Understanding Driver Behavior after Concussion: A Machine-Learning Approach
Maryam Daniali, Drexel University | Dario Salvucci, Drexel University | Maria Schultheis, Drexel University |

PROGRAM **AGENDA**

MONDAY, OCTOBER 5, 2020 / 4:00 PM - 5:30 PM CENTRAL TIME

SESSION DETAILS

AS1: GENERAL AVIATION WEATHER HAZARDS: CURRENT HUMAN FACTORS RESEARCH, PILOT PRACTICES, AND TOOLS
Track: Aerospace Systems
Session Type: Discussion Panel

Elizabeth Blickensderfer, Embry-Riddle Aeronautical University | Lori Brown, Western Michigan University | Alyssa Greenman, ForeFlight | Jayde King, Embry-Riddle Aeronautical University | Brandon Pitts, Purdue University |

A2: HUMAN FACTORS AND AGING: A 20-YEAR RETROSPECTIVE AND PROSPECTIVE FROM CREATE

Track: Aging
Session Type: Discussion Panel

Human Factors and Aging: A 20-year Retrospective and Prospective from CREATE
Wendy Rogers, University of Illinois Urbana-Champaign | Sara Czaja, Weill Cornell Medicine | Neil Charness, Florida State University | Joseph Sharit, University of Miami | Walter Boot, Florida State University

AC1: AUGMENTED COGNITION
Track: Augmented Cognition
Session Type: Lecture
Chair: See virtual meeting platform for Chair information
Co-Chair: See virtual meeting platform for Chair information

Designing an Augmented Reality Based Interface for Wearable Exoskeletons
Chaitanya Kulkarni, Virginia Tech | Hsiang-Wen Hsing, Virginia Tech | Dina Kandil, Virginia Tech | Shriya Kommaraju, Virginia Tech | Nathan Lau, Virginia Tech | Divya Srinivasan, Virginia Tech |

Detection and Mitigation of Inefficient Visual Searching
Alex Kamrud, University States Air Force | Josh Gallaher, | Brett Borghetti, Air Force Institute of Technology |

Dynamic Causal Modeling of Gender Differences in Emotion: Implications for Augmented Cognition
Jiali Huang, North Carolina State University | Chang Nam, North Carolina State University | Kristen Lindquist, |

Emotion Recognition with a CNN using Functional Connectivity-based EEG Features
Chang Nam, North Carolina State University | Sanghyun Choo, North Carolina State University |

How Long Can a Driver (Safely) Glance at an Augmented-Reality Head-Up Display?
Nayara De Oliveira Faria, Virginia Tech | Joseph Gabbard, Virginia Tech |

More than Means: Characterizing Individual Differences in Pupillary Dilations
Ciara Sibley, Naval Research Library | Cyrus Foroughi, Naval Research Laboratory | Noelle Brown, Naval Research Laboratory | Henry Phillips, NAMI | Sabrina Drollinger | Michael Eagle

MONDAY, OCTOBER 5, 2020 / 4:00 PM - 5:30 PM CENTRAL TIME

SESSION DETAILS

CS2: HUMAN PERFORMANCE AND STANDARDS

Track: Computers Systems
Session Type: Lecture
Chair: See virtual meeting platform for Chair information
Co-Chair: See virtual meeting platform for Chair information

A Longitudinal Study Investigating the Effects of Workload and Exposure on 3D Gestural Human Computer Interaction
Katherina Jurewicz, Oklahoma State University | David Neyens, Clemson University |

Come Closer: Experimental Investigation of Robots' Appearance on Proximity, Affect and Trust in a Domestic Environment
Linda Miller, Ulm University | Johannes Kraus, Ulm University | Franziska Babel, Ulm University | Matthias Messner, Ulm University | Martin Baumann, Ulm University |

Impact of Agents' Errors on Performance, Reliance and Trust in Human-Agent Collaboration
Sylvain Daronnat, University of Strathclyde | Leif Azzopardi, University of Strathclyde | Martin Halvey, University of Strathclyde |

ISO Human-Computer Interaction Standards: Finding Them and What They Contain
Paul Green, U of Michigan, UMTRI |

Patterns of Interaction with Information Sources: A Case Study of a Home Healthcare Admission Nurse Completing Medication-related Activities
Ellen Bass, Drexel University | Elease McLaurin, Drexel University |

The Unreasonable Ineptitude of Deep Image Classification Networks
Shane Mueller, Michigan Technological University | Priyansh Agarwal, Michigan Technological University | Anne Linja, Michigan Technological University | Nisarg Dave, Group K Diagnostics | Lamia Alam, Michigan Technological University |

GS2: INCLUSION AND ACCESSIBILITY IN THE HUMAN FACTORS AND ERGONOMICS SOCIETY

Track: General Sessions
Session Type: Discussion Panel

Jacklin Stonewall, Iowa State University | Kylie Gomes, University of Virginia | Theresa Nguyen, Texas Tech University | Kermit Davis, University of Cincinnati | Sarah Coppola, Johns Hopkins University | Kim Hallett, Triton Systems, Inc. | Rua Williams, University of Florida |

HP1: RECENT ADVANCEMENT IN HUMAN PERFORMANCE MODELING

Track: Human Performance Modeling
Session Type: Lecture
Chair: Dick Steinberg, Raytheon Company
Co-Chair: Heejin Jeong, University of Illinois at Chicago

A Cut Above the Rest: Team Performance as a Function of Team Cohesion, Team Familiarity, Team Effectiveness, and Soldier Lethality
Kathryn Seyer, USMA | Joshua Eaton, DOD, US Army |

Quantifying Dynamic Resilience using First-Process Autoregressive Modelling: An Empirical Study
Luke Crameri, Deakin University | Imali Hettiarachchi, Deakin University | Samer Hanoun, Deakin University |

Relating Subjective Workload and Effort to Performance During Stable and Shifting Task Demands: A Multilevel Approach
Justine Rockwood, University of Oklahoma | Eric Anthony Day, University of Oklahoma | Derek Mracek, Lambda School |

Relationship between Motion Sickness and Accuracy of Vestibulo-Ocular Reflex
Hikaru Sato, Ritsumeikan University | Yuki Sato, Ritsumeikan University | Tahiro Wada, Ritsumeikan University

The Prediction of Collisions in Connected Vehicle Systems with A Long Short-Term Memory Model
Rohit Mishra, Pennsylvania State University, University Park | Yiqi Zhang, Penn State University, University Park | Anlong Li, Pennsylvania State University | Fenglong Ma, Pennsylvania State University |

Understanding Heart Rate Reactions to Post Traumatic Stress Disorder (PTSD) Among Veterans
Mahnoosh Sadeghi, Texas A&M University | Farzan Sasangohar, Texas A&M University | Sudeep Hegde, Texas A&M University | Anthony McDonald, Texas A&M University |

PROGRAM **AGENDA**

MONDAY, OCTOBER 5, 2020 / 4:00 PM - 5:30 PM CENTRAL TIME

SESSION DETAILS

ST2: SECONDARY TASK ENGAGMENT WHILE DRIVING: FRIEND AND FOE?
Track: Surface Transportation
Session Type: Discussion Panell

Taylor Shupsky, Wichita State University | Kevin Morales, Wichita State University | Carryl Baldwin, Wichita State University | Peter Hancock, University of Central Florida | William Horrey, AAA Foundation for Traffic Safety | Eric Greenlee, Texas Tech University | Charlie Klauer, Virginia Polytechnic Institute and State University |

VE1: VIRTUAL REALITY IMMERSION AND EFFECTIVENESS
Track: Virtual Environments
Session Type: Lecture
Chair: Sarah Beadle, Clemson University
Co-Chair: Rod Roscoe, Arizona State University

Accuracy of Time Duration Estimations in Virtual Reality
Steve Mallam, University of South-Eastern Norway | Jørgen Ernstsen, University of South-Eastern Norway | Salman Nazir, University of South-Eastern Norway |

Safety Perception and Behaviors during Human-Robot Interaction in Virtual Environments
Daxton Mitchell, Texas Tech University | HeeSun Choi, Texas Tech University | Justin Haney, National Institute for Occupational Safety and Health |

Simulate and Sense Force Exertions during Virtual Patient Transfer Tasks
Ken Chen, Department of Industrial&Systems Engineering , NCSU | Rebecca Widmayer, Department of Industrial & Systems Engineering, NCSU | Karen Chen, Department of Industrial&Systems Engineering, NCSU |

The Effect of Task Complexity on Time Perception in the Virtual Reality Environment: An EEG Study
Jiaxin Li, University of Washington | Griselda Phiberta, University of Washington | Ji-Eun Kim, University of Washington |

The Evaluation of User Experience and Functional Workload of a Physically Inter-active Virtual Reality System
Suman Chowdhury, Texas Tech University | Syed Tanzim Mubarrat, Texas Tech University | Oluwatosin Opafunso, Texas Tech University |

Virtual Reality Preflight Training Using Vestibular-Visual Conflicts to Reduce Space Adaptation Sickness Symptoms
Sarah Hopko, Texas A&M University | Ranjana Mehta, Texas A&M University |

AS2: SAFETY IS A JOURNEY, NOT A DESTINATION: UNDERSTANDING AND MITIGATING RISKS
Track: Aerospace Systems
Session Type: Lecture
Chair: See virtual meeting platform for Chair information
Co-Chair: See virtual meeting platform for Chair information

A Comparison of Rule-Based and Machine Learning Models for Classification of Human Factors Aviation Safety Event Reports
Katherine Darveau, GE Aviation & Tufts University | Daniel Hannon, Tufts University | Chad Foster, GE Aviation

A Review of Stall-type Accident Statistics over the Past Fifty Years
Nicoletta Fala, Oklahoma State University |

Flight Performance and Mental Stress of Pilots by Verbal Reports and Spatial Disorientation
Yohan Kang, Republic of Korea Air Force | Myung Hwan Yun, Seoul National University | Sungho Kim, Seoul National University |

Friendlier Skies: Development of Electronic Checklists for Emergency Procedures for the KC-135 Stratotanker
Cara Fausset, Georgia Tech Research Institute | Elizabeth Weldon, , GTRI | Latrice Williams, GTRI | Matt Boyle, 121st Air Refueling Wing | Kevin Cartwright, 121st Air Refueling Wing | Mark Robinson, , 121st Air Refueling Wing | Joe Bosch, 121st Air Refueling Wing | Marcia Crosland, GTRI | Bayne Meeks, GTRI |

Narrative Analysis of Runway Incursion Reports in the National Transportation Safety Board Database to Identify Contributing Human Errors and Its Causes
Divya Bhargava, Purdue University | Karen Marais, Purdue University |

TUESDAY, OCTOBER 6, 2020 / 12:00 PM - 1:30 PM CENTRAL TIME

SESSION DETAILS

A3: PHYSICAL FACTORS IN SYSTEMS DESIGN FOR OLDER PERSONS

Track: Aging
Session Type: Lecture
Chair: Wendy Rogers, University of Illinois Urbana-Champaign

A User Study on the Feasibility and Acceptance of Delivering Physical Activity Programs to Older Adults through Conversational Agents
Jessie Chin, University of Illinois at Urbana-Champaign | Kelly Quinn, University of Illinois at Chicago | Naoko Muramatsu, University of Illinois at Chicago | David Marquez, University of Illinois at Chicago |

Functional Anthropometry of Aging Women: An Examination of the Waist-Hip-Thigh Region
Linsey Griffin, University of Minnesota |

RomVision: A New Model for the Application of Computer Vision to Joint Health
Lorenzo-Barberis Canonico, Clemson University | Annie Kaferle, | Justin Prior, |

The Effects of Engagement in Physical Exercise on Semi-autonomous Takeover Request Perception Between Younger and Older Adults
Gaojian Huang, Purdue University | Brandon Pitts, Purdue University |

Toward a Framework for Embodiment in Communication Technologies: Facilitating Social Connectivity for Older Adults
George Mois, University of Georgia, Institute of Gerontology and University of Georgia School of Social Work | Jenay Beer, Health Promotion & Behavior, Institute of Gerontology |

CYB1: COLLABORATION, TRAINING, AND TEAMWORK IN CYBERSECURITY

Track: Cybersecurity
Session Type: Lecture
Chair: Anand Gramopadhye, Clemson University

Challenges and Opportunities in Collaborative Vulnerability Research Workflows
Ryan Mullins, Aptima, Inc. | Deirdre Kelliher, Aptima, Inc. | Ben Nargi, Aptima, Inc. | Mike Keeney, Aptima, Inc. | Nathan Schurr, Aptima, Inc. |

Effect of Facts Box on Users' Comprehension of Differential Privacy: A Preliminary Study
Aiping Xiong, Penn State University | Tianhao Wang, Purdue University | Ninghui Li, Purdue University | Somesh Jha, University of Wisconsin |

Leet: A Card Game for Teaching Cybersecurity Concepts
Courtney Falk, Infinite Machines

Lessons Learned in Leveraging Existing Simulations for Cybersecurity Training, Evaluation, and Research
Daniel Mabie, San José State University | David Schuster, San José State University |

Modeling Information Pooling Bias in Incident Response Teams: An Agent Based Modeling Approach
Prashanth Rajivan, University Of Washington | Nancy Cooke, Arizona State University |

What Makes Phishing Emails Hard for Humans to Detect?
Kuldeep Singh, Carnegie Mellon University | Palvi Aggarwal, Carnegie Mellon University | Prashanth Rajivan, University Of Washington | Cleotilde Gonzalez, Carnegie Mellon University |

HC1: PATIENT SAFETY LEARNING LABS: WHAT ARE WE ACTUALLY LEARNING?

Track: Health Care
Session Type: Discussion Panel

Shilo Anders, Vanderbilt University Medical Center | Emily Patterson, Ohio State University | Ken Catchpole, Medical University of South Carolina | Richard Holden, Indiana University | Ayse Gurses, Johns Hopkins University | Matthew Weinger, Vanderbilt University Medical Center | Yan Xiao, University of Texas-Arlington

PROGRAM **AGENDA**

TUESDAY, OCTOBER 6, 2020 / 12:00 PM - 1:30 PM CENTRAL TIME

SESSION DETAILS

ME1: "WHAT THE ORGANIZATION HAS": AN INVESTIGATION OF SITUATIONAL ASPECTS OF SAFETY CULTURE OF ROAD TRAFFIC ORGANIZATION USING A MACROERGONOMIC APPROACH
Track: Macroergonomics
Session Type: Discussion Panel

Andrijanto, University of Tsukuba | Makoto Itoh, University of Tsukuba |

PD1: SUPPORTING WORKER PERFORMANCE AND COMFORT
Track: Product Design
Session Type: Lecture
Chair: See virtual meeting platform for Chair information
Co-Chair: See virtual meeting platform for Chair information

Assessing the Ergonomic Benefits of a New Adjustable Forklift Backrest
Pranav Madhav Kuber, Rochester Institute of Technology | Ehsan Rashedi, Rochester Institute of Technology |

Blue Light Exposure Effects on Sleep Attributes in a 72-hour Military Exercise
Stephanie Brown, U.S. Army Combat Capabilities Development Command Soldier Center | Linda DeSimone, U.S. Army Combat Capabilities Development Command Soldier Center | Tina Burke, U.S. Army Combat Capabilities Development Command Soldier Center |

Designing with Extraordinary People: Stories of Creating Accessible Technology for the Five Percent
Kim Hallett, Triton Systems, Inc. |

Investigating Inclusive Design of Shared Automated Vehicles with Full-Scale Modeling
Kamolnat Tabattanon, University of Michigan | Patrik Schuler, University of Michigan | Clive D'Souza, Center for Ergonomics, University of Michigan |

Sensitivity of Wrist-Wearables to Changes in Physical and Mental Demands
Jackie Cha, Purdue University | Fajar Ausri, Purdue University | Laura Mudge, Purdue University | Denny Yu, Purdue University |

The Effects of Keyboard Layout and Size on Smartphone Typing Performance
Barbara Chaparro, Embry-Riddle Aeronautical University | Colton Turner, | Inga Sogaard, | Jibo He, |

ST3: PEDESTRIAN AND BICYCLIST SAFETY
Track: Surface Transportation
Session Type: Lecture
Chair: Brandon Pitts, Purdue University
Co-Chair: Michael Clamann

Does Crossing the Road in a Group Influence Pedestrians' Gaze Behavior?
Mirjam Lanzer, Ulm University | Martin Baumann, Ulm University |

How Signs, Markings, and Hazards Impact Motorist Assessment of Cyclist Lane Placement
Mary Still, Old Dominion University | Jeremiah Still, Old Dominion University |

Pedestrians' Understanding of Fully Autonomous Vehicle's (FAV) Intent to Stop
Michal Hochman, Ben Gurion University of the Negev | Tal Oron-Gilad, Ben Gurion University of the Negev |

The Temporal Dynamics By Which Drivers Become Aware of Bicyclists Who Use Taillights In Daytime
Darlene Edewaard, Clemson University | Richard Tyrrell, Clemson University | Patrick Rosopa, Clemson University | Andrew Duchowski, Clemson University | Ellen Szubski, Clemson University | Savana King, Clemson University |

Visibility of an In-ground Signal when Texting While Walking
Eunjee Kim, Ulsan National Institute of Science and Technology | Hyorim Kim, Ulsan National Institute of Science and Technology | Yujin Kwon, Ulsan National Institute of Science and Technology | Gwanseob Shin, Ulsan National Institute of Science and Technology |

TUESDAY, OCTOBER 6, 2020 / 2:00 PM - 3:30 PM CENTRAL TIME

SESSION DETAILS

AS3: HUMAN FACTORS IN FUTURE VERTICAL LIFT, THE UNITED STATES ARMY'S NEXT GENERATION ROTORCRAFT

Track: Aerospace Systems
Session Type: Discussion Panel

Katie Ernst, Applied Decision Science, Inc., Michael Wilson, US Army Aeromedical Research Laboratory | David Durbin, US Army Data and Analysis Center (DAC) Human Systems Integration Division | Emilie Roth, Roth Cognitive Engineering | Laura Militello, Applied Decision Science, Inc. | Kevin Oden, Lockheed Martin, Rotary and Mission Systems | Robert Copeland, U.S. Army Futures Command Systems Readiness Directorate Aviation and Missile Center |

K1: IDENTIFYING HAZARDS AT RESIDENTIAL AND COMMERCIAL POOLS: AN INTERACTIVE SESSION

Track: Children's Issues
Session Type: Alternative Format

Leah Hartman, Applied Building Sciences, Inc. | Stephanie Whetsel Borzendowski, Applied Building Sciences, Inc. | Alison Vredenburgh, Vredenburgh & Associates, Inc. | Alan Campbell, Applied Building Sciences, Inc. | Ilene Zackowitz, |

DECEPTION IN CYBERSECURITY

Track: Cybersecurity
Session Type: Lecture
Chair: Amal Ponathil, Clemson University

An Exploratory Study of a Masking Strategy of Cyberdeception UsingCyberVAN
Palvi Aggarwal, Carnegie Mellon University | Omkar Thakoor, University of Southern California | Aditya Mate, Harvard University | Milind Tambe, Harvard University | Edward Cranford, Carnegie Mellon University | Christian Lebiere, Carnegie Mellon University, Pittsburgh | Cleotilde Gonzalez, Carnegie Mellon University |

Cue Utilization, Trait Anxiety and Phishing Email Susceptibility
Annastasia Falkenberg, University of Adelaide | Jaime Auton, University of Adelaide | Kathryn Parsons, Defence Science Technology Group |

Cyber Buzz: Examining Virality Characteristics of Cybersecurity Content in Social Networks
Thomas Shields, Georgia Tech Research Institute | Hannah Li, Georgia Tech Research Institute | Peter Lebedev, Georgia Tech Research Institute | Josiah Dykstra, National Security Agency |

Cybersecurity Teamwork: A Review of Current Practices and Suggested Improvements
Richard Simonson, Embry-Riddle Aeronautical University | Joseph Keebler, Embry-Riddle Aeronautical University | Matthew Lessmiller, Embry-Riddle Aeronautical University | Tyson Richards, Embry-Riddle Aeronautical University | John Lee, Embry-Riddle Aeronautical University |

What Attackers Know and What They Have to Lose: Framing Effects on Cyber-attacker Decision Making
Edward Cranford, Carnegie Mellon University | Cleotilde Gonzalez, Carnegie Mellon University | Palvi Aggarwal, Carnegie Mellon University | Milind Tambe, Harvard University | Christian Lebiere, Carnegie Mellon University, Pittsburgh |

PROGRAM **AGENDA**

TUESDAY, OCTOBER 6, 2020 / 2:00 PM - 3:30 PM CENTRAL TIME

SESSION DETAILS

HC2: SENSOR-BASED TECHNOLOGIES FOR PATIENT SAFETY

Track: Health Care
Session Type: Lecture
Chair: See virtual meeting platform for Chair information

A Systematic Review and Meta-analysis of Randomized Controlled Trials to Evaluate Technology-Supported Exercise Programs for Knee Health
Tianrong Chen, The University of Hong Kong | Calvin Or, The University of Hong Kong | Jiayin Chen, The University of Hong Kong |

Effect of Guided Tactical Breathing with Biofeedback on Acute Stress Attenuation and Marksmanship Performance of Novice Shooters
Ramtin Loftabadi, University of Waterloo | Joshua Granek, Defence Research and Development Canada | Jiayuan He, University of Waterloo | Ning Jiang, University of Waterloo | Fan He, University of Waterloo | Junhan Bae, Defence Research and Development Canada | Hamid Boland, Defence Research and Development Canada | Catherine Burns, University of Waterloo |

Surgeon Postures during Deep Inferior Epigastric Perforator Flap Breast Reconstruction Procedures: A Pilot Study
Tianke Wang, Mayo Clinic | Katherine Law, Mayo Clinic | Minh-Doan Nguyen, Mayo Clinic | Christin Harless, Mayo Clinic | Susan Hallbeck, Mayo Clinic |

Task Analysis on Yoga Poses Toward a Wearable Sensor-based Learning System for Users with Visual Impairment
Melanie Grudinschi, University of Arizona | Kyle Norland, University of Arizona | Sang Won Lee, Virginia Tech | Sol Lim, University of Arizona |

The Path to DIEPS by Dinner Involves the Entire Operative Team
Katherine Law, Mayo Clinic | Anna Linden, Mayo Clinic | Christin Harless, Mayo Clinic | Minh-Doan Nguyen, May Clinic | Susan Hallbeck, Mayo Clinic |

Use of Wearable Sensors and Machine Learning Methods in Promoting Total Joint Replacement Treatment Outcomes a Survey
Mustafa Ozkan Yerebakan, University of Florida | Boyi Hu, University of Florida | Xiang Zhong, University of Florida | Hari Parvataneni, University of Florida | Chancellor Gray, University of Florida College of Medicine

IDI1: INDIVIDUAL DIFFERENCES AND INTERNET

Track: Individual Differences in Performance, Internet
Session Type: Lecture
Chair: See virtual meeting platform for Chair information

A Systematic Review of the Semantic Vigilance Literature
Alexis Neigel, Industry | Lindsay Dhanani, Ohio University | Grace Waldfogle, University of Central Florida | Victoria Claypoole, University of Central Florida | James Szalma, University of Central Florida |

Individual Differences in Estimating Numeric Variability
Kimberly Spahr, Colorado State University | Christopher Wickens, Colorado State University | Benjamin Clegg, Colorado State University | CAP Smith, Colorado State University |

Is Smartphone Usage Predicting Fear of Missing Out and Loneliness in a Sample from the Generation Z?
Malgorzata Rys, Kansas State University | Cristiane Kauer Brazil, Kansas State University |

On The Field: Examining Differences in Video Format in Sports Media Viewing
Ragan Wilson, North Carolina State University | Christopher Mayhorn, North Carolina State University |

The Effect of Task Complexity on Eye Movement and Multitasking Performance in Students With and Without ADHD
Madison Johnson, University of Washington | Ji-Eun Kim, University of Washington |

The Use of Non-spatial Strategies in the Direction Orientation Task
Joseph Coyne, Naval Research Laboratory | Noelle Brown, Naval Research Laboratory | Cyrus Foroughi, Naval Research Laboratory | Ciara Sibley, Naval Research Laboratory | Ericka Rovira, U.S. Military Academy | Emily Sexauer, U.S. Military Academy |

TUESDAY, OCTOBER 6, 2020 / 2:00 PM - 3:30 PM CENTRAL TIME

SESSION DETAILS

ME2: MACROERGONOMICS

Track: Macroergonomics
Session Type: Lecture
Chair: See virtual meeting platform for Chair information

A High Reliability Organization (HRO)-based Retrospective Analysis of Boeing 737 Max Crashes
Yalda Khashe, USC | Soraya Levy, University of Southern California |

Assessment of the Fixed 4-hours on/8-hours Off Watchstanding Schedule on a Surface Vessel of the Swedish Royal Navy
Nita Shattuck, Naval Postgraduate School | Panagiotis Matsangas, Naval Postgraduate School | Joakim Dahlman, Swedish National Road and Transport Research Institute (VTI) | Anna Dahlman, Swedish National Road and Transport Research Institute (VTI) |

Crew Endurance Training in the United States Navy: Interim Assessment of a 3-year Project
Nita Shattuck, Naval Postgraduate School | Pangiotis Matsangas, Naval Postgraduate School | Heather Clifton, Naval Postgraduate School | Jennifer Hart, Middlebury Institute of International Studies | Charles Czeisler, Brigham and Women's Hospital/Harvard Medical School | Laura Barger, Brigham and Women's Hospital/Harvard Medical School

Exploring Informal Caregiver Workload using a Macroergonomics Lens on Multiple Resources
Siddarth Ponnala, University of Wisconsin - Madison | Nicole Werner, University of Wisconsin-Madison |

Interactive Team Cognition in Incident Action Planning: A Network Approach to Assess Work-As-Done Within and Between Multidisciplinary Crisis Management Teams
Jukrin Moon, Texas A&M | Farzan Sasangohar, Texas A&M University | S. Camille Peres, Texas A&M University | Changwon Son, Texas A&M University |

PD2: TOOLS AND METHODS FOR UNDERSTANDING USER NEEDS

Track: Product Design
Session Type: Lecture
Chair: See virtual meeting platform for Chair information

A Data Analytics Approach to Persona Development for the Future Mobile Office
Amudha Kamaraj, University of Wisconsin-Madison | Mengyao Li, University of Wisconsin-Madison | Atefeh Katrahmani, University of Wisconsin Madison | John Lee, University of Wisconsin-Madison |

Anthropometric Analysis to Build Ergonomic Equipment
Priyadarshini Dasgupta, Southeastern Louisiana University | Lisa Kuhn, Southeastern Louisiana University | Jonathan Faulk, Southeastern Louisiana University |

Development of a Civilian 3D Hand Scan Database
Bethany Juhnke, University of Minnesota | Colleen Pokorny, University of Minnesota | Linsey Griffin, University of Minnesota | Susan Sokolowski, University of Oregon |

Method to Develop a Better Performance Glove Pattern Block Using 3D Hand Anthropometry
Susan Sokolowski, University of Oregon | Linsey Griffin, University of Minnesota |

Remote Health Monitoring in Children: Needfinding in Parents
Michael Schwartz, UCF Institute for Simulation and Training | Shannon Bryant, Georgia Institute of Technology | Paul Oppold, UCF Institute for Simulation and Training | Glenn Martin, UCF Institute for Simulation and Training |

This or That? Instruction for Use (IFU): IF U Could Pick Your Dream Printout Format
Young Chun, Takeda Pharmaceutical Company | Jeremy Honig, Takeda Pharmaceutical Company

PROGRAM **AGENDA**

TUESDAY, OCTOBER 6, 2020 / 2:00 PM - 3:30 PM CENTRAL TIME

SESSION DETAILS

ST4: AUTOMATION

Track: Surface Transportation
Session Type: Lecture
Chair: Swaroop Dinakar, Crash Safety Research Center, LLC
Co-Chair: Shannon Roberts, University of Massachusetts

A Preliminary Investigation of Driver Vigilance in Automated Vehicles in Real Traffic Environments
Yi Liu, Lamar University | Ruobing Zhao, Lamar University | Tianjian Li, Lamar University | Yueqing Li, Lamar University |

Decision Aiding for Nautical Collision Avoidance: Trust, Dependence, and Implicit Understanding of the Decision Algorithm
Christopher Wickens, Colorado State University | Nicholas Fitzgerald, Fort Collins PD | Benjamin Clegg, Colorado State University | CAP Smith, Colorado State University | Dylan Orth, Colorado State University Psychology | Katie Kincaid, Colorado State University Psychology |

Driver Arousal and Workload under Partial Vehicle Automation a Pilot Study
Monika Lohani, University of Utah | Joel Cooper, University of Utah | Gus Erickson, University of Utah | Trent Simmons, University of Utah | Amy McDonnell, University of Utah | Amanda Carriero, University of Utah | Kaedyn Crabtree, University of Utah | David Strayer, University of Utah |

Driver Logo Sign Detection and Hazard Responses Under Partial Vehicle Automation
Stephen Cauffman, North Carolina State University | Jing Feng, NCSU | David Kaber, University of Florida | Yunmei Liu, University of Florida | Christopher Cunningham, Institute for Transportation Research and Education | Yulin Deng, North Carolina State University |

Driving with Robots: Mind Perception and Propensity for Aggressive Driving
Karl Nachmann, George Mason University | Benjamin Pillot, George Mason University | Petrina Pervall, George Mason University | Yi-Ching Lee, George Mason University | Eva Wiese, George Mason University |

Lights, Camera, Autonomy! Exploring the Opinions of Older Adults Regarding Autonomous Vehicles Through Enactment
Aaron Gluck, Clemson University | Earl Huff, Clemson University | Mengyuan Zhang, Clemson University | Julian Brinkley, Clemson University |

TUESDAY, OCTOBER 6, 2020 / 4:00 PM - 5:30 PM CENTRAL TIME

SESSION DETAILS

AS4: INNOVATION IS HERE TO STAY: AUTONOMY AND THE HUMAN

Track: Aerospace Systems
Session Type: Lecture
Chair: See virtual meeting platform for Chair information

An Evaluation of UAS Pilot Workload and Acceptability Ratings with Four Simulated Radar Declaration Ranges
Jillian Keeler, NASA Ames Research Center | R. Conrad Rorie, NASA Ames Research Center | Kevin Monk, NASA Ames Research Center | Garrett Sadler, San Jose State University | Casey Smith, NASA Ames Research Center |

Examining Teamwork of Space Crewmembers and Mission Control Personnel under Crew Autonomy a Multiteam System Perspective
Ute Fischer, Georgia Tech | Kathleen Mosier, TeamScape LLC

Impact of UAS with Low Size, Weight, and Power Sensors on Air Traffic Controllers' Performance and Acceptability Ratings
Kim-Phuong Vu, California State University Long Beach | Jonathan VanLuven, California State University Long Beach | Timothy Diep, California State University Long Beach | Vernol Battiste, San Jose State University Foundation-NASA Ames | Summer Brandt, NASA Ames Research Center | Kevin Monk, NASA Ames Research Center | R. Conrad Rorie, NASA Ames Research Center | Robert Shively, NASA Ames Research Center | Thomas Strybel, CSULB | Garrett G. Sadler, NASA Ames Research Center |

Investigating Attitudes Towards Drone Delivery
Hinnerk Eißfeldt, DLR German Aerospace Center | Verena Vogelpohl, DLR German Aerospace Center | Albert End, DLR German Aerospace Center |

UAS Pilot Assessments of Display and Alerting for the Airborne Collision Avoidance System XU
Casey Smith, NASA Ames Research Center | R. Conrad Rorie, NASA Ames Research Center | Kevin Monk, NASA Ames Research Center | Garrett Sadler, NASA Ames Research Center | Jillian Keeler, NASA Ames Research Center |

TUESDAY, OCTOBER 6, 2020 / 4:00 PM - 5:30 PM CENTRAL TIME

SESSION DETAILS

CYB3: HUMANS AND TECHNOLOGY FOR INCLUSIVE PRIVACY AND SECURITY

Track: Cybersecurity
Session Type: Discussion Panel

Sanchari Das, University of Denver | Robert Gutzwiller, Arizona State University | Rod Roscoe, Arizona State University | Prashanth Rajivan, University of Washington | Yang Wang, University of Illinois, Urbana-Champaign | L. Jean Camp, Indiana University Bloomington | Roberto Hoyle, Oberlin College |

HC3: COGNITION, DECISION-MAKING AND RISK ASSESSMENTS IN HEALTHCARE

Track: Health Care
Session Type: Lecture
Chair: See virtual meeting platform for Chair information

A Cognitive Aid to Support In-hospital Resuscitation Teams: An Experimental Evaluation in a Medical Simulation
Tobias Grundgeiger, Julius-Maximilians-Universität Würzburg | Felix Hahn, University Hospital Würzburg | Thomas Wurmb, University Hospital Würzburg | Oliver Happel, University Hospital Würzburg |

A Proactive Risk Assessment Methodology to Enhance Patient Safety: Reducing Wrong Site Surgery as a Preventable Medical Error
Maryam Tabibzadeh, California State University, Northridge | Gelareh Jahangiri, California State University, Northridge |

Anonymity in Questions and Answers About Health
Cheng Guo, Clemson University | Kelly Caine, Clemson University |

Evaluation and Prediction of Human Error in Ambulance-Based Telemedicine Stroke Assessment
Hunter Rogers, Clemson University | | Amal Ponathil, Clemson University | Kapil Chalil Madathil, Clemson University | Anjali Joseph, Clemson University | Nathan McNeese, Clemson University | Christine Holmstedt, Medical University of South Carolina | James McElligott, Medical University of South Carolina |

Illuminating the Decision-Making Strategies of Anesthesia Providers in Challenging Cases
Joshua Biro, Clemson University | David Neyens, Clemson University | Candace Jaruzel, Medical University of South Carolina | Catherine Tobin, Medical University of South Carolina | Myrtede Alfred, Medical University of South Carolina | Sarah Coppola, Johns Hopkins University | James Abernathy, III, Johns Hopkins University | Ken Catchpole, Medical University of South Carolina |

Physician Perceptions of Disposition Decision-making for Older Adults in the Emergency Department: A Preliminary Analysis
Rachel Rutkowski, University of Wisconsin-Madison, Department of Industrial and Systems Engineering | Megan Salwei, University of Wisconsin-Madison, Department of Industrial and Systems Engineering | Hanna Barton, University of Wisconsin-Madison, Department of Industrial and Systems Engineering | Kathryn Wust, University of Wisconsin-Madison, Department of Industrial and Systems Engineering | Peter Hoonakker, Wisconsin Institute for Healthcare Systems Engineering | Maria Brenny-Fitzpatrick, UW Transitional Care Team | Barbara King, University of Wisconsin-Madison, School of Nursing | Manish N. Shah, Berbee Walsh Department of Emergency Medicine, University of Wisconsin-Madison | Michael Pulia, Berbee Walsh Department of Emergency Medicine, University of Wisconsin-Madison | Brian W. Patterson, Berbee Walsh Department of Emergency Medicine, University of Wisconsin-Madison | Maureen Smith, University of Wisconsin-Madison School of Medicine and Public Health, Departments of Population Health Sciences and Family Medicine & Community Health and University of Wisconsin Institute of Clinical and Translational Research Health Innovation Program | Pascale Carayon, Department of Industrial & Systems Engineering | Nicole Werner, University of Wisconsin-Madison

ME3: SCALING OUR IMPACT: EMERGING HUMAN FACTORS APPLICATIONS ADDRESSING SOCIETAL CHALLENGES

Track: Macroergonomics
Session Type: Discussion Panel

Courtney Rogers, University of Virginia | Rupa Valdez, University of Virginia | Juan Gilbert, University of Florida | Karen Lange Morales, Universidad Nacional de Colombia: Bogota, CO | Enid Montague, DePaul University | Wendy Rogers, University of Illinois Urbana-Champaign | Andrew Thatcher, University of the Witwatersrand, Johannesburg | Abigail Wooldridge, University of Illinois at Urbana-Champaign |

PROGRAM **AGENDA**

PD3: WHEN USER RESEARCH LEADS DESIGN ASTRAY
Track: Product Design
Session Type: Discussion Panel

Keith Karn, Human Factors in Context LLC | Christy Harper, End to End User Research | Alisa Rantanen, Insight Innovation Center | Rochelle Edwards, Google | Michael Bartha, HP Inc

ST5: ATTENTION, VISION, AND GLANCE BEHAVIOR
Track: Surface Transportation
Session Type: Lecture
Chair: Shiyan Yang, Seeing Machines
Co-Chair: Wayne Giang, University of Florida

Attentional Control in Young Drivers: Does Training Impact Hazard Anticipation in Dynamic Environments?
Sarah Yahoodik, Old Dominion University | Yusuke Yamani, Old Dominion University |

-Driver Visual Processing of Relevant and Irrelevant Information During Mind Wandering
Richard Wagner, North Carolina State University | Michael Geden, North Carolina State University | Jing Feng, NCSU | Sophie Forster, University of Sussex |

Individual Differences in Glance Patterns Under Distraction in Level 2 Automated Driving
Shiyan Yang, Seeing Machines | Jonny Kuo, Seeing Machines | Michael Lenne, Seeing Machines |

Investigating the Effect of Education and Drowsiness Detection on Nurses' Beliefs and Attitudes towards Drowsy Driving
Alec Smith, Texas A&M University | Farzan Sasangohar, Texas A&M University | Anthony McDonald, Texas A&M | Karim Zahed, Texas A&M University |

Police Officer Interactions with In-vehicle Technologies: An On-Road Investigation
Farzaneh Shahini, Texas A&M University | Marayam Zahabi, Texas A&M University | Benjamin Patranella, Texas A&M University | Ashiq Mohammed Abdul Razak, Texas A&M University |

VE2: AUGMENTED REALITY IN A HUMAN FACTORS WORLD
Track: Virtual Environments
Session Type: Lecture
Chair: Shannon Bailey, Immertec
Co-Chair: Shawn Doherty, Embry-Riddle Aeronautical University

"We Didn't Catch That!" Using Voice Text Input on a Mixed-Reality Headset in Noisy Environments
Jessyca Derby, Embry-Riddle Aeronautical University | Emily Rickel, Embry-Riddle Aeronautical University | Kelly Harris, Embry-Riddle Aeronautical University | Jade Lovell, Embry-Riddle Aeronautical University | Barbara Chaparro, Embry-Riddle Aeronautical University |

Can Augmented Reality Assist Data Entry Task? A Preliminary Study
Ankit Singh, University of Illinois at Chicago | Taylor Huynh, University of Illinois at Chicago | Myunghee Kim, University of Illinois at Chicago | Andrew Johnson, University of Illinois at Chicago | Heejin Jeong, University of Illinois at Chicago |

Effect of Head-Mounted Augmented Reality Devices on Electric Utility Manhole Workers: Neck Muscle Activity and Eye Blink Rate
Ashley Toll, Milwaukee Tool | Richard Marklin, Marquette University | Eric Bauman, Electric Power Research Institute | John Simmons, Alfred University |

Investigating a Virtual Reality-based Emergency Response Scenario and Intelligent User Interface for First Responders
Randall Spain, Center for Educational Informatics, NCSU | Jason Saville, Center for Educational Informatics, NCSU | Barry Liu, NCSU | Donia Slack, RTI | Edward Hill, RTI International | John Holloway, RTI | Sarah Norsworthy, RTI | Bradford Mott, Center for Educational Informatics, NCSU | James Lester, Center for Educational Informatics, NCSU |

Predicting User Performance in Augmented Reality User Interfaces with Image Analysis Algorithms
Jonathan Flittner, Virginia Polytechnic Institute and State University | John Luksas, Virginia Polytechnic and State Institution | Joseph Gabbard, Virginia Tech

The Effects of Target Sizes on Biomechanical Exposures and Perceived Workload during Virtual and Augmented Reality Interactions
Kiana Kia, Oregon State University | Nizam Hakim, Oregon State University | Jaejin Hwang, Northern Illinois University | Jeong Ho Kim, Oregon State University |

WEDNESDAY, OCTOBER 7 / 12:00 PM - 1:30 PM CENTRAL TIME

SESSION DETAILS

AS5: HUMAN FACTORS CHALLENGES IN URBAN AIR MOBILITY (UAM)

Track: Aerospace Systems
Session Type: Discussion Panel

Scott Scheff, HF Designworks, Inc. | Ferne Friedman-Berg, FAA | Robert Shively, NASA Ames Research Center | Michael Feary, NASA AMESA | Julie Diiulio, Applied Decision Science | Andrew Carter, ResilienX |

CE1: DECISION AIDS

Track: Cognitive Engineering & Decision Making
Session Type: Lecture
Chair: Sam Hepenstal, Defense Science Technology Laboratory
Co-Chair: Theresa Kessler, University of Central Florida

A Communication Interface for a Dismounted Ground Commander and an Intelligent Autonomous Unmanned Aerial Systems (IA-UAS) – A Feasibility Study
Regina Ziv-Shchegolsky, BGU | Ilit Oppenheim, BGU | Yisrael Parmet, BGU | Tal Oron-Gilad, Ben Gurion University of the Negev

Cue Utilization as an Objective Metric in Naturalistic Decision-Making
Mark Wiggins, Macquarie University |

Decision-Making Model for Emergency Evacuation Based on the Lens Model Using Machine Learn-ing and Monte-Carlo Simulation for Incomplete Information Environment
Miriam Alabi, North Carolina A&T State University | Younho Seong, North Carolina Agricultural and Technical State University | Sun Yi, North Carolina Agricultural and Technical State University |

Design of a Decision Support Application to Support Individuals in Mental Health Crisis
Amanda Johnson, State University of New York at Buffalo | Ann Bisantz, State University of New York at Buffalo | Scott Meier, State University of New York at Buffalo | Amy Reynolds, State University of New York at Buffalo |

ProBot – A Procedure Chatbot for Digital Procedural Adherence
Nilesh Ade, Mary Kay O'Connor Process Safety Center | Noor Quddus, Mary Kay O'Connor Process Safety Center | Trent F. Parker, Texas A&M University | S. Camille Peres, Texas A&M University

Under Pressure – How Time Pressure Affects Automation-Aided Decision-Making in a Luggage Screening Task
Tobias Rieger, Technische Universität Berlin | Dietrich Manzey, Technische Universität Berlin |

GS3: DESIGNING FOR DIVERSITY: IMPLICATIONS FOR RESEARCH AND PRACTICE

Track: General Sessions
Session Type: Discussion Panel

Abigail Wooldridge, University of Illinois at Urbana-Champaign | Rod Roscoe, Arizona State University | Shannon Roberts, University of Massachusetts-Amhers | Rupa Valdez, University of Virginia

HC4: PREDICTING THE FUTURE: DIVERSE PERSPECTIVES ON THE TRANSFORMATION OF HEALTHCARE DELIVERY OVER THE NEXT 15 YEARS

Track: Health Care
Session Type: Discussion Panel

Emily Patterson, The Ohio State University | Shilo Anders, Vanderbilt University Medical Center | Laura Militello, Applied Decision Science, LLC | Jason Saleem, University of Louisville | Shawna Perry, University of Florida College of Medicine-Jacksonville | Clayton Rothwell, Infoscitex Corporation | Dustin Weiler, Department of Industrial and Systems Engineering, University of Wisconsin-Madison |

PROGRAM **AGENDA**

WEDNESDAY, OCTOBER 7 / 12:00 PM - 1:30 PM CENTRAL TIME

SESSION DETAILS

OE1: OCCUPATIONAL ERGONOMICS 1
Track: Occupational Ergonomics
Session Type: Lecture
Chair: Joel Cort, University of Windsor
Co-Chair: Robert Radwin, University of Wisconsin

Classifying Lifting-Lowering Height and Load Level using Inertial Sensor-based Kinematics: An Initial Study
Sol Lim, University of Arizona | Clive D'Souza, University of Michigan |

Evaluating Postural Risk Level of Digitally Represented Workplace: Analyzing Postural Possibilities
Hayoun Moon, Seoul National University | Woojin Park, Seoul National University |

Evaluation of Hologram Distances in Reducing Shoulder Stress during Augmented Reality Interactions
Jeong Ho Kim, Oregon State University | Hemataja Ari, Northern Illinois University | Charan Madasu, Northern Illinois University | Jaejin Hwang, Northern Illinois University |

Posture and Performance Trade-offs with Different Computer Monitor Configurations
Kaitlin Gallagher, University of Arkansas | Caleb Burruss, University of Arkansas | Elizabeth Bjornsen, University of Arkansas |

Prediction of Occupational Physical Activities using Inertial Measurement Units and Deep Learning Models
Yishu Yan, University of California, Berkeley | Hao Fan, Northwestern Polytechnical University | Yibin Li, University of California, Berkeley | Elias Hoeglinger, University of Applied Sciences Upper Austria, Linz | Alexander Wiesinger, University of Applied Sciences Upper Austria, Linz | Alan Barr, UC Ergonomics Program | Carisa Harris-Adamson, University of California, Berkeley |

Relationship Between Computer Vision Estimated Trunk Kinematics and Work-Related Low-Back Pain
Runyu Greene, University of Wisconsin-Madison | Ming-Lun Lu, NIOSH | Yu Hen Hu, University of Wisconsin-Madison | Robert Radwin, University of Wisconsin-Madison |

PDC1: PRODUCT DESIGN AND COMMUNICATIONS
Track: Communications, Product Design
Session Type: Lecture
Chair: See virtual meeting platform for Chair information

Designing 360° Video for Immersive Journalism
Deb Pang Davis, University of Miami | Barbara Millet, University of Miami |

Do You Need to Travel? Mapping Face-to-Face Communication Objectives to Technology Affordances
Rachel Dianiska, Iowa State University | Charles Peasley, Iowa State University | Nicholas Wilson, Iowa State University | Neil Barnett, Iowa State University | Leilani Hammel, Iowa State University | Ben Purdy, Iowa State University | Peggy Wu, Iowa State University | Elizabeth Shirtcliff, Iowa State University | James Oliver, Iowa State University | Stephen Gilbert, Iowa State University |

Inclusive Design Guidance External Autonomous Vehicle Interfaces
Karina Roundtree, Oregon State University | Steven Hattrup, Oregon State University | Janani Swaminathan, Oregon State University | Nicholas Zerbel, Oregon State University | Jeffrey Klow, Oregon State University | Vivswan Shitole, Oregon State University | Abrar Fallatah, Oregon State University | Roli Khanna, Oregon State University | Julie Adams, Oregon State University |

Public Trust and Acceptance for Concepts of Remotely Operated Urban Air Mobility Transportation
Eric Chancey, National Aeronautics and Space Administration (NASA) | Michael Politowicz, National Aeronautics and Space Administration (NASA) |

Robot Career Fair: An Exploratory Evaluation of Anthropomorphic Robots in Various Career Categories
Nathan Tenhundfeld, University of Alabama in Huntsville | Elizabeth Phillips, George Mason University | Jacob Davis, University of Alabama in Huntsville |

Visualizing Uncertainty in Weather Forecasts
Qinyu Ding, University of Miami | Barbara Millet, University of Miami |

WEDNESDAY, OCTOBER 7 / 12:00 PM - 1:30 PM CENTRAL TIME

SESSION DETAILS

T1: TRAINING
Track: Training
Session Type: Lecture
Chair: See virtual meeting platform for Chair information

A Mixed Methods Approach to Define Tactile Requirements for a Part-Task Trainer
Ian Dykens, Sonalysts, Inc. | Stephen Dorton, Sonalysts - Human-Autonomy Interaction Laboratory | Margaret Bailey, Sonalysts, Inc. | Teresita Sotomayor, US Army Civilian |

Examining the Medium in Which Feedback Is Delivered on Young Drivers' Speed Management Behavior: An On-road Study
Oleksandra Molloy, University of New South Wales Canberra, Australian Defence Force Academy | Brett Molesworth, University of New South Wales | Ann Williamson, University of New South Wales |

Objective Assessment Metrics for Central Line Simulators: An Exploration of Causal Factors
Jessica Gonzalez-Vargas, Penn State | Dailen Brown, Penn State | Jason Moore, Penn State | David Han, Hershey Medical Center | Elizabeth Sinz, Hershey Medical Center | Cheyenne Sonntag, Hershey Medical Center | Scarlett Miller, The Pennsylvania State University |

Using Relevant Time Clock Refresher Training for Improvement in Identifying Aviation Traffic
Andy Dattel, Embry-Riddle Aeronautical University | Hui Wang, Embry-Riddle Aeronautical University | Cristhian Padilla, Embry-Riddle Aeronautical University | Peiheng Gao, Embry-Riddle Aeronautical University | Kwang Song, Embry-Riddle Aeronautical University | Zihao Zhang, Embry-Riddle Aeronautical University | Andrew Henry, Embry-Riddle Aeronautical University | Tianxi Zhang, Embry-Riddle Aeronautical University | Agha Rahim, Embry-Riddle Aeronautical University |

WEDNESDAY, OCTOBER 7 / 2:00 PM - 3:30 PM CENTRAL TIME

SESSION DETAILS

AS6: DESIGNING THE FUTURE: TECHNOLOGIES IN AEROSPACE
Track: Aerospace Systems
Session Type: Lecture
Chair: See virtual meeting platform for Chair information

Effect of Gesture Interface Mapping on Controlling a Multi-degree-of-freedom Robotic Arm in a Complex Environment
Sherrie Holder, University of Michigan | Leia Stirling, University of Michigan |

Improving Support for Contingency Planning in Air Traffic Flow Management
Alicia Fernandes, Mosaic ATM | Chris Brinton, Mosaic ATM |

Pros and Cons of A VR-based Flight Training Simulator | Empirical Evaluations by Student and Instructor Pilots
Chang-Geun Oh, Kent State University |

Systems Thinking in Aerospace: The Contributions to the Design of Future Airliners' Single Pilot Operations
Daniela Schmid, Independent Researcher | Neville Stanton, University of Southampton |

The Use of Enhanced Flight Vision Systems (EFVS) for Low-Visibility Takeoffs in Part 121 Operations
Dennis Beringer, FAA Civil Aerospace Medical Institute | Kelene Fercho, FAA/CAMI |

PROGRAM **AGENDA**

CE2: ATTENTION AND TRAINING
Track: Cognitive Engineering & Decision Making
Session Type: Lecture
Chair: Audrey Reinert, University of Oklahoma

A Model of Monitoring as Sensemaking: Application to Flight Path Management and Pilot Training
Dorrit Billman, SJSU @ NASA Ames Research Center | Randall Murnaw, SJSU @ NASA Ames Research Center | Michael Feary, NASA AMESA |

An Adaptive Fuzzy Modeling of Visual Attention in Real-world Interaction with Health Information System
Smriti Sridhar, University of Virginia | Younghoon Kwon, University of Virginia Health Systems | Yeilim Cho, University of Virginia Health Systems | Inki Kim, University of Illinois |

Propositional Constraint Graphs: An Intuitive, Domain-General Tool for Diagramming Arguments, Knowledge, and Causal Constraints
Zachary Pugh, North Carolina State University | Douglas Gillan, North Carolina State University |

Providing a Foundation for Interpretable Autonomous Agents through Elicitation and Modelling of Criminal Investigation Pathways
Sam Hepenstal, Defence Science Technology Laboratory |

Real Life Does Not Always Get in the Way: Verbal Memory and the Sustained Attention to Response Task
Samantha Smith, Michigan Technological University | Graham Edgar, University of Gloucestershire | Paul Russell, University of Canterbury | William Helton, George Mason Univerisity |

E1: DOING, SAYING, LEARNING, PLAYING: INTERACTIVE ACTIVITIES FOR INTRODUCTORY HF/E COURSES
Track: Education
Session Type: Discussion Panel

Heather Lum, Embry-Riddle Aeronautical University | Gabriella Hancock, California State University, Long Beach | Shawn Doherty, Embry-Riddle Aeronautical University | Ashley Hughes, University of Illinois at Chicago |

GS4: UX & HF: THE STATE OF THE UNION
Track: General Sessions
Session Type: Discussion Panel

Melissa Meingast, Hewlett Packard Enterprise | Tim Ballew, Vrbo | Michael Bartha, HP Inc. | Christy Harper, End to End User Research | Danae Holmes, Google | Pieter Kruithof, IBM |

HC5: INNOVATIONS IN SIMULATION-BASED TRAINING IN HEALTHCARE
Track: Health Care
Session Type: Discussion Panel

Christen Sushereba, Unveil, LLC | Ellen Deutsch, Children's Hospital of Philadelphia | Emily Patterson, Ohio State Unversity | Laura Militello, Applied Decision Science, LLC | Matthew Zackoff, Cincinnati Children's Hospital Medical Center | Mary Ottolini, The Barbara Bush Children's Hospital | Jennifer Winner, Air Force Research Laboratory |

OE2: REPORTS FROM THE FIELD: CURRENT CHALLENGES IS ASSESSING RISK FROM PUSH PULL TASKS AND GAPS IN THE RESEARCH BASE
Track: Occupational Ergonomics
Session Type: Discussion Panel

Thomas Albin, High Plains Engineering Services | Robert Fox, General Motors | Sean Gallagher, Auburn University | Eric Weston, Spine Research Institute | Neal Wiggermann, Hillrom |

WEDNESDAY, OCTOBER 7 / 2:00 PM - 3:30 PM CENTRAL TIME

SESSION DETAILS

ST6: TAKEOVER, FAILURES, AND ERRORS IN AUTOMATION

Track: Surface Transportation
Session Type: Lecture
Chair: Yiqi Zhang, Pennsylvania State University
Co-Chair: Miguel Perez, Virginia Tech

A Framework for Understanding where Failures May Occur in Highly Automated Driving
Kuan-Ting Chen, University at Buffalo | Ercan Sahin, University of Buffalo | Su Shen, University at Buffalo | Ann Bisantz, University of Buffalo | Huei-Yen Winnie Chen, University at Buffalo |

Examining Effects of Scenario Type and Vehicle Speed on Takeover Readiness and Performance in Conditionally Automated Driving
Na Du, University of Michigan | Jinyong Kim, University of Michigan | Feng Zhou, University of Michigan | Anuj Pradhan, Mechanical and Industrial Engineering | Dawn Tilbury, University of Michiga, Lionel P. Robert, SI | Jessie Yang, IOE |

Highlighting the Driver's Responsibilities When Using Conditional Driving Automation: Effects on Take-over Performance and Monitoring
Dustin Souders, Purdue University | Shubham Agrawal, Purdue University | Yujie Li, Purdue University | Srinivas Peeta, Georgia Institute of Technology |

Investigating the Effects of Automated Driving Styles and Driver's Driving Styles on Driver Trust, Acceptance, and Take Over Behaviors
Zheng Ma, Pennsylvania State University, University Park | Yiqi Zhang, Pennsylvania State University, University Park |

Modeling Post-takeover Avoidance and Stabilization Steering Control in Automated Vehicles
Hananeh Alambeigi, Texas A&M University | Anthony McDonald, Texas A&M |

The Rise, Fall, and Repair of Trust for Automated Driving Systems
Scott Mishler, Old Dominion University | Jing Chen, Old Dominion University |

THURSDAY, OCTOBER 8, 2020 / 12:00 PM - 1:30 PM CENTRAL TIME

SESSION DETAILS

CE3: FRONTIERS OF HUMAN-MACHINE TEAMING: HOW HUMAN FACTORS IS CONTRIBUTING

Track: Cognitive Engineering & Decision Making
Session Type: Discussion Panel

Michael Rayo, The Ohio State University | Emilie Roth, Roth Cognitive Engineering | Alexander Morison, Mile2, LLC | Daniel Zelik, Air Force Research Laboratory | Stoney Trent, U.S. Army |

E2: THE RE-EDUCATION OF THE HUMAN FACTORS ENGINEER IN THE AGE OF DATA SCIENCE

Track: Education
Session Type: Discussion Panel

Daniel Hannon, Tufts University | Esa Rantanen, Rochester Institute of Technology | John Lee, University of Wisconsin-Madison | Ben Sawyer, University of Central Florida | Katherine Darveau, GE Aviation & Tufts University | Robert O'Donnell, U.S. Coast Guard & Tufts University | James Intriligator, Tufts |

GS5: HFES STUDENT CHAPTERS: A DISCUSSION OF BEST PRACTICES

Track: General Sessions
Session Type: Discussion Panel

Grace Waldfogle, University of Central Florida | Katie Lucaites, Clemson University | Emily Brunsen, North Carolina State University | Jessyca Derby, Embry-Riddle Aeronautical University

PROGRAM **AGENDA**

HC6: HUMAN FACTORS APPLICATIONS IN SPECIAL AREAS
Track: Health Care
Session Type: Lecture
Chair: See virtual meeting platform for Chair information

An Exploration of the Role of the Social Environment in the Identification of Glycemic Events
John Corbett, University | Jiwoon Bae, University of Virginia | Mark DeBoer, University of Virginia | Daniel Chernavsky, University of Virginia | Stephen Patek, University of Virginia | Claire Wellbeloved-Stone, University of Virginia | Rupa Valdez, University of Virginia

Exploring Work System Adaptations in Providing Care for Children with Medical Complexity in the Home
Hanna Barton, University of Wisconsin - Madison, Department of Industrial and Systems Engineering | Shanmugapriya Loganathar, University of Wisconsin Madison, Department of Industrial and Systems Engineering | Nawang Singhe, University of Wisconsin - Madison, Department of Industrial and Systems Engineering | Mary Ehlenbach, University of Wisconsin-Madison, Department of Pediatrics | Barbara Katz, Family Voices of Wisconsin | Ryan Coller, University of Wisconsin-Madison, Department of Pediatrics | Nicole Werner, University of Wisconsin-Madison

Identifying Roles in Older Adults' Emergency Department Transitions
Megan Salwei, University of Wisconsin-Madison, Department of Industrial and Systems Engineering | Hanna Barton, University of Wisconsin - Madison, Department of Industrial and Systems Engineering | Nicole Werner, University of Wisconsin-Madison | Rachel Rutkowski, University of Wisconsin - Madison, Department of Industrial and Systems Engineering | Peter Hoonakker, Wisconsin Institute for Healthcare Systems Engineering | Kathryn Wust, University of Wisconsin - Madison, Department of Industrial and Systems Engineering | Manish N. Shah, Berbee Walsh Department of Emergency Medicine, University of Wisconsin-Madison | Brian Patterson, Berbee Walsh Department of Emergency Medicine, University of Wisconsin-Madison | Michael S. Pulia, Berbee Walsh Department of Emergency Medicine, University of Wisconsin-Madison | Azita Hamedani, Berbee Walsh Department of Emergency Medicine, University of Wisconsin-Madison | Maureen Smith, University of Wisconsin-Madison School of Medicine and Public Health, Departments of Population Health Sciences and Family Medicine & Community Health and University of Wisconsin Institute of Clinical and Translational Research Health Innovation Program | Barbara King, University of Wisconsin-Madison, School of Nursing | Pascale Carayon, Department of Industrial & Systems Engineering |

Interventions to Improve Interprofessional Bedside Rounds in a Paediatric Critical Care Unit
Alanna Bateman, University of Toronto | Sonia Pinkney, Institute of Health Policy, Management and Evaluation, University of Toronto | Jessica Tomasi, Queens University | Peter Laussen, The Hospital for Sick Children | Patricia Trbovich, University of Toronto

Strategies for Improving Patient Engagement in Perioperative Pain Management: An Observational Study
Amro Khasawneh, Johns Hopkins University | Marie Hanna, Johns Hopkins University | Ronen Shechter, Johns Hopkins University | Ronen Shechter, Johns Hopkins University | Jamia Saunders, Johns Hopkins University | Samuel Kim, Johns Hopkins University | Eileen McDonald, Johns Hopkins University | Yea-Jen Hsu, Johns Hopkins University | Anping Xie, Johns Hopkins University |

Understanding Patterns in Neonatal Trajectories in the First 10 Minutes After Birth
Jelena Zestic, The University of Queensland | Helen Liley, The University of Queensland | Penelope Sanderson, The University of Queensland |

THURSDAY, OCTOBER 8, 2020 / 12:00 PM - 1:30 PM CENTRAL TIME

SESSION DETAILS

OE3: OCCUPATIONAL ERGONOMICS 3

Track: Occupational Ergonomics
Session Type: Lecture
Chair: Carisa Harris Adamson, University of California, San Francisco & Berkeley
Co-Chair: Stephen Bao, Washington State Department of Labor and Industries, SHARP Program

A Machine Learning Approach to Hand-Arm Motion Prediction for Active Upper Extremity Occupational Exoskeleton Devices
Simon Kudernatsch, Texas A&M University | Chris Wolfe, Northern Illinois University | Hasan Ferdowsi, Northern Illinois University | Donald Peterson, Northern Illinois University

Benefits and Barriers to Passive Occupational Exoskeleton Adoption in Manufacturing Companies
Diana Schwerha, Ohio University | Nathan McNamara, Ohio University | Maury Nussbaum, Virginia Tech | Sunwook Kim, Virginia Tech

Effects of Back-Support Exoskeleton Use on Gait Performance
Jangho Park, Virginia Tech | Youngjae Lee, Virginia Tech | Sunwook Kim, Virginia Tech | Maury Nussbaum, Virginia Tech | Divya Srinivasan, Virginia Tech

Effects of Passive Back-Support Exoskeleton Designs on Trunk Muscle Activity and Energy Expenditure during Repetitive Lifting
Saman Madinei, Virginia Tech | Mohammad Mehdi Alemi, Harvard Medical School | Sunwook Kim, Virginia Tech | Divya Srinivasan, Virginia Tech | Maury Nussbaum, Virginia Tech

Effects of Using a Whole-body Powered Exoskeleton on Physical Demands during Manual Handling
Hanjun Park, Virginia Tech | Sunwook Kim, Virginia Tech | Willow Lawton, Virginia Tech | Maury Nussbaum, Virginia Tech | Divya Srinivasan, Virginia Tech

Neural Efficiency of Human-Exoskeleton Interactions during Asymmetrical Manual Handling Tasks
Yibo Zhu, Texas A&M University | Eric Weston, Ohio State University | Ranjana Mehta, Texas A&M University | William Marras, Spine Research Institute, The Ohio State University

PD5: PRODUCT DESIGN PATTERNS FOR HEALTHCARE, AUTONOMOUS VEHICLES, AND SEARCH
Track: Healthcare, Perception and Performance, Product Design
Session Type: Lecture
Chair: See virtual meeting platform for Chair information

Arranging Icons on Small Displays: Do Hexagonal Layouts Improve Search Performance?
Tassilo Bouwman, University College London | Duncan Brumby, University College London

Autonomous Vehicle Design Anti-Patterns: Making Emerging Transportation Technologies Inaccessible by Design
Julian Brinkley, Clemson University | Earl Huff, Clemson University | Suyash Ahire, Clemson University

Comparison of Auditory Icon Alarms and Spearcon Sequences for Patient Monitoring
Emma Knight, The University of Queensland | Alison Utting, The University of Queensland | Penelope Sanderson, The University of Queensland

Complexity of Documentation Needs for Children with Medical Complexity
Matthew Scanlon, Medical College of Wisconsin | Denny Yu, Purdue University

Evaluating the Efficacy of a Mobile, Augmented Reality Pediatric Code Cart Education Application
John Morgan, University of Illinois at Urbana-Champaign | Abigail Wooldridge, University of Illinois at Urbana-Champaign | Anthony Composto, University of Illinois at Urbana-Champaign | Ashley Mitchell, University of Illinois at Urbana-Champaign | Widya Ramadhani, University of Illinois at Urbana-Champaign | Jyotika Roychowdhury, University of Illinois at Urbana-Champaign | Keith Hanson, University of Illinois College of Medicine at Peoria | Elsa Vazquez-Melendez, University of Illinois College of Medicine at Peoria | Harleena Kendhari, University of Illinois College of Medicine at Peoria | Nadia Shaikh, University of Illinois College of Medicine Peoria | Teresa Riech, University of Illinois College of Medicine at Peoria | Matthew Mischler, University of Illinois College of Medicine at Peoria | Sara Krzyzaniak, University of Illinois College of Medicine | Ginger Barton, OSF HealthCare Children's Hospital of Illinois | Kyle Formella, Jump Simulation Center, OSF Healthcare | Zachary Abbott, Jump Simulation Center, OSF Healthcare | John Farmer, Jump Simulation Center, OSF Healthcare | Rebecca Ebert-Allen, OSF Healthcare System | Trina Croland, University of Illinois College of Medicine at Peoria

Female Voice Agents in Fully Autonomous Vehicles Are Not Only More Likeable and Comfortable, But Also More Competent

S1: SAFETY & RISK ANALYSIS
Track: Safety
Session Type: Lecture
Chair: See virtual meeting platform for Chair information

A Framework for Analyzing Residential Fire Outcomes in Homes with Operative Smoke Alarms
Natalie Motta-Mena, Exponent | Christy Clonginger, Exponent | Genevieve Nauhaus, Exponent

Battery-Related Injuries in Children and Adults
Jacqueline Zimmermann, Exponent, Inc. | Danielle King, Exponent, Inc. | Caroline Crump, Exponent, Inc.

Enhancing Safety in the Security and Alarm Monitoring Industry: A Case Study in the Development of Job Hazard Analyses
Ellen Bass, Drexel University | Polly College, Drexel University

Fatigue As a Performance Shaping Factor in Human Reliability Analysis for Long-Duration Spaceflight
Ronald Boring, Idaho National Laboratory | Thomas Ulrich, Idaho National Laboratory | Torrey Mortenson, Idaho National Laboratory | David Gertman

HFACS Analysis of U.S. General Aviation Accidents Using Bayesian Network
Chuyang Yang, Purdue University | John Mott, Purdue University

The Accident Network (AcciNet): A New Accident Analysis Method for Describing the Interaction Between Normal Performance and Failure
Paul Salmon, Centre for Human Factors and Sociotechnical Systems, University of the Sunshine Coast | Adam Hulme, University of the Sunshine Coast | Guy Walker, Heriot Watt | Patrick Waterson, Loughborough University | Neville Stanton, University of Southampton

THURSDAY, OCTOBER 8, 2020 / 12:00 PM - 1:30 PM CENTRAL TIME

SESSION DETAILS

U1: EVALUATION OF PRACTICAL SYSTEMS

Track: Usability and System Evaluation
Session Type: Lecture
Chair: James Cunningham, USAF

A Mirror-in-the-Sky Navigation Aid: A Summary of Qualitative Feedback from Soldier and Civilian Users
Holland Vasquez, University of Toronto | Adam Reiner, University of Toronto | Greg Jamieson, University of Toronto | Justin Hollands, University of Toronto

Develop and Evaluate an Augmented Reality Posture Training Tool to Promote Work Safety
Ken Chen, Fitts Department Industrial and Systems Engineering, North Carolina State University | Gimantha Perera, Fitts Department Industrial and Systems Engineering, North Carolina State University | Li Li, Fitts Department Industrial and Systems Engineering, North Carolina State University | Xu Xu, Fitts Department Industrial and Systems Engineering, North Carolina State University | Karen Chen, Fitts Department Industrial and Systems Engineering, North Carolina State University

Evaluating the Usability of University Waste-Sorting Systems
Nathan Dumessa, Clemson University | Katie Lucaites, Clemson University | Hannah Solini, Clemson University | Jeremy Lopez, Clemson University | Paige Lawton, Clemson University | Suyash Ahire, Clemson University

Multimodal Displays to Reduce Distraction in Locomotive Engineers
Rachel Grice, University of Maryland, Baltimore County | Donald Fisher, Volpe National Transportation Systems Center | Matthew Isaacs, Volpe National Transportation Systems Center

Soda Machine and User Experience: A Study of Icon Display
Vera Puglisi, State University of New York at Binghamton | Jasmine Ghorbani, State University of New York at Binghamton | Yan Chen, State University of New York at Binghamton | Manuel Nyagisere, State University of New York at Binghamton | Grace Babalola, State University of New York at Binghamton | Tianqi Smith, State University of New York at Binghamton

Towards a Multi-Culture Friendly Online Library: An Investigation on the Effect of Wording and Color Contrast
Guanlong Li, TJUT | Ruobing Zhao, Lamar University | Yueqing Li, Lamar University | Jing Zhang, Lamar University

THURSDAY, OCTOBER 8, 2020 / 2:00 PM - 3:30 PM CENTRAL TIME

SESSION DETAILS

CE4: RISK, STRATEGY, AND ASSESSMENT

Track: Cognitive Engineering & Decision Making
Session Type: Lecture
Chair: Dorritt Billman, NASA

Considering a Meso-Ergonomic Factor: Can Accountability Reduce Errors?
Pouria Salehi, Arizona State University | Erin Chiou, Arizona State University

Evaluating Risk-Propensity Assessment Methods: Patterns in Repeated Exposure to Emotional Stimuli
Sahinya Susindar, Texas A&M University | Harrison Wissel-Littmann, Texas A&M University | Terry Ho, Texas A&M University | Thomas Ferris, Texas A&M University

Evaluating Situation Assessment in Distributed Network Electricity Control
Mark Wiggins, Macquarie University | Daniel Sturman, University of Adelaide | Jaime Auton, University of Adelaide

Implications for Using Mobile Ecological Momentary Assessment to Collect Climate Response Data from Vulnerable Urban Populations
Jacklin Stonewall, Iowa State University | Michael Dorneich, Iowa State University | Ulrike Passe, Iowa State University | Linda Shenk, Iowa State University

Operator Responsibility for Outcomes: A Demonstration of the ResQu Model
Nir Douer, Tel Aviv University | Meirav Redlich, Tel Aviv University | Joachim Meyer, Tel Aviv University

Paper-Rock-Scissors: An Exploration of the Dynamics of Players' Strategies
Hanshu Zhang, Carnegie Mellon University | Frederic Moisan, University of Cambridge | Cleotilde Gonzalez, Carnegie Mellon University | Hanshu Zhang, Carnegie Mellon University

GS6: PLANNING THE SABBATICAL: POTENTIAL BENEFITS, OPTIONS AND STRATEGIES.
Track: General Sessions
Session Type: Invited Symposium

Ellen Bass, Drexel University | Barrett Caldwell, Purdue University | Caroline Cao, Wright State University, IMT Atlantique, LS2N | John Lee, University of Wisconsin-Madison | Christopher Miller, Smart Information Flow Technologies

HC7: CHILDREN WITH MEDICAL COMPLEXITY: CHALLENGES AND OPPORTUNITIES FOR HUMAN FACTORS/ ERGONOMICS
Track: Health Care
Session Type: Discussion Panel

Hanna Barton, University of Wisconsin - Madison, Department of Industrial and Systems Engineering | Sara Finesilver, Madison College | Ryan Coller, University of Wisconsin-Madison, Department of Pediatrics | Christopher Lunsford, Duke University | Rupa Valdez, University of Virginia | Nicole Werner, University of Wisconsin-Madison

AI1: HUMAN, AI, ROBOT TEAMING AND THE FUTURE OF WORK: BARRIERS AND OPPORTUNITIES FOR ADVANCEMENT
Track: Human AI Robot Teaming (AI)
Session Type: Discussion Panel

Erin Chiou, Arizona State University | Eric Holder, US Army Combat Capabilities Development Command- Army Research Laboratory | Igor Dolgov, Uber Elevate | Kaleb McDowell, US Army Combat Capabilities Development Command-Army Research Laboratory | Lance Menthe, RAND Corporation | Rod Roscoe, Arizona State University | Shivam Zaveri, Arizona State University

OE4: ASSESSING PSYCHOSOCIAL AND PERSONAL FACTORS IN INDUSTRIAL WORK: ISSUES AND CHALLENGES FOR THE OCCUPATIONAL ERGONOMICS PRACTITIONER AND RESEARCHER
Track: Occupational Ergonomics
Session Type: Discussion Panel

Robert Fox, General Motors | Missie Smith, Oakland University | Carisa Harris Adamson, University of California, San Francisco & Berkeley | Menekse Barim, NIOSH | Ming-Lun Lu, NIOSH | Sean Gallagher, Auburn University | Jeannie Nigam, NIOSH | Stephen Bao, Washington State Department of Labor and Industries, SHARP Program | Robert Fox, General Motors

THURSDAY, OCTOBER 8, 2020 / 2:00 PM - 3:30 PM CENTRAL TIME

SESSION DETAILS

U2: IMPROVING THE TOOLS OF THE TRADE

Track: Usability and System Evaluation
Session Type: Lecture
Chair: Pam Munro, Feiji Consulting
Co-Chair: Heather Wojton, Institute for Defense Analyses

A User-Centered Decision-Aiding Process for Selecting Power Analysis Tools
Ya-Hsin Hung, Purdue University | Jeong Yun Choi, Purdue University | Mairéad Willis, Purdue University | Robert Proctor, Purdue University | Erin Hennes, Purdue University | Sean Lane, Purdue University

Sentiment Analysis of Participant Comments in a User Centered Design Study for Degraded Visual Environment Sensor Visualization
Bradley Davis, US Army CCDC Data and Analysis Center | Samineh Gillmore, University of Alabama in Huntsville | Derek Millard, The University of Alabama in Huntsville

The Design and Assignment of Microgestures to Commands for Virtual and Augmented Reality Tasks
Guangchuan Li, Beijing Institute of Technology | David Rempel, University of California, Berkeley | Yue Liu, Beijing Institute of Technology | Carisa Harris-Adamson, University of California, Berkeley

User Support Systems: Lessons Learned from Implementing Multiple Interaction Methods During Testing
Tyler Duke, University of Houston-Clear Lake | William Althoff, | Dylan Shouten, College of Arts, Media, and Design, Northeastern University | Camillia Matuk, Educational Communication and Technology, New York University Educational Communication and Technology | Casper Harteveld, College of Arts, Media and Design, Northeastern University | Gillian Smith, WPI | Steven Sutherland, University of Houston-Clear Lake

User-Centered Design of Statistics for Researchers: The Case of Ronald A. Fisher
Robert Proctor, Purdue University | Ya-Hsin Hung, Purdue University

Using User Experience Scales to Predict Video Game Play and Purchasing Intent
William Shelstad, Embry-Riddle Aeronautical University | Ameer Hosein, Embry-Riddle Aeronautical University | Joseph Keebler, Embry-Riddle Aeronautical University | Barbara Chaparro, Embry-Riddle Aeronautical University

THURSDAY, OCTOBER 8, 2020 / 4:00 PM - 5:00 PM CENTRAL TIME

SESSION DETAILS

CE5: COGNITIVE ENGINEERING AT WORK AND IN THE FIELD

Track: Cognitive Engineering & Decision Making
Session Type: Lecture
Chair: Jacklin Stonewall, Iowa State University

Abstraction Hierarchy Based Explainable Artificial Intelligence
Murat Dikmen, University of Waterloo | Catherine Burns, University of Waterloo

Assessing the Ability of Multidimensional Scaling and Pathfinder Networks to Measure Spatial Knowledge
Douglas Gillan, North Carolina State University | Caleb Furlough, Citrix

Defining Design Space of the AutoMobile Office: A Computational Abstraction Hierarchy Analysis
Mengyao Li, University of Wisconsin Madison | Atefeh Katrahmani, University of Wisconsin-Madison | Amudha Kamaraj, University of Wisconsin-Madison | John Lee, University of Wisconsin-Madison

Predicting Graceful Extensibility of Human-Machine Systems: A New Analysis Method for Evaluating Extensibility Plots to Anticipate Distributed System Performance
Dane Morey, The Ohio State University | Jesse Marquisee, The Ohio State University | Ryan Gifford, The Ohio State University | Morgan Fitzgerald, The Ohio State University | Michael Rayo, The Ohio State University

The Planning Bias in the Spatial Rendezvous: Partial Compensation for Temporal Uncertainty
Colleen Patton, Colorado State University | Christopher Wickens, Colorado State University | Benjamin Clegg, Colorado State University | CAP Smith, Colorado State University | Xiaoyan Zhou, Colorado State University

Towards a Context-Dependent Framework for Visualizing Mental Models
Samantha Harper, Sonalysts, Inc. | Stephen Dorton, Sonalysts – Human-Autonomy Interaction Library

AI2: TRANSDISCIPLINARY TEAM RESEARCH TO DEVELOP THEORY OF MIND IN HUMAN-AI TEAMS
Track: Human AI Robot Teaming (AI)
Session Type: Discussion Panel

Stephen Fiore, University of Central Florida | Bethany Bracken, Charles River Analytics | Mustafa Demir, Arizona State University | Jared Freeman, Aptima | Michael Lewis, University of Pittsburgh | Lixiao Huang, Arizona State University

OE5: OCCUPATIONAL ERGONOMICS 5
Track: Occupational Ergonomics
Session Type: Lecture
Chair: Ranjana Mehta, Texas A&M University

Designing an Occupational Exposure Report for Aircraft Rescue and Firefighting Firefighters
Barbara Millet, University of Miami

Development of an Observation-based Tool for Ergonomic Exposure Assessment in Informal Electronic Waste Recycling and Other Unregulated Non-repetitive Work
Augustine Acquah, University of Ghana | Clive D'Souza, Center for Ergonomics, University of Michigan | Bernard Martin, University of Michigan, Center for Ergonomics | John Arko-Mensah, School of Public Health, University of Ghana | Paul Botwe, University of Ghana | Prudence Tettey, School of Public Health, University of Ghana | Duah Dwomoh, University of Ghana | Isabella Quakyi, School of Public Health, University of Ghana | Thomas Robins, University of Michigan | Julius Fobil, School of Public Health, University of Ghana | Afua Asabea Nti, University of Ghana | Lawrencia Kwarteng, School of Public Health, University of Ghana | Sylvia Takyi, University of Ghana

Ergonomic Evaluation of Orchard Ladders with Shorter Rung Spacing
Fadi Fathallah, UC Davis | Victor Duraj, UC Davis | Tyler Hunter, UC Davis

Leadership Styles in Participatory Ergonomics Programs: A Bibliometric Analysis
Mark Schall, Jr. | Auburn University | Jesse Michel, Auburn University

Psychophysically Based Physical Capability Limits For Right Angle Power Tool Operation
Jonathan Valencia, University of Windsor | Joel Cort, University of Windsor

The Social Value of Participatory Ergonomics from a Practitioner's Perspective
Katia Costa-Black, BSI EHS Services and Solutions | Chris Arteberry, BSI EHS Services and Solutions

THURSDAY, OCTOBER 8, 2020 / 4:00 PM - 5:00 PM CENTRAL TIME

SESSION DETAILS

S3: COGNITION AND PERFORMANCE
Track: Safety
Session Type: Lecture
Chair: See virtual meeting platform for Chair information

A Comparison of Workload Demands Imposed by Different Types of Distracted Walking Tasks and Its Effect on Gait
Haolan Zheng, University of Florida | Yue Luo, University of Florida | Boyi Hu, University of Florida | Wayne Giang, University of Florida

A Video Survey on Minimal Risk Maneuvers and Conditions
Burak Karakaya, Technical University of Munich | Luis Kalb, Technical University of Munich | Klaus Bengler, Technical University of Munich

Influences of Smartphone Operation on Gait and Posture During Outdoor Walking Task
Yue Luo, University of Florida | Haolan Zheng, University of Florida | Yuhao Chen, University of Florida | Wayne Giang, University of Florida | Boyi Hu, University of Florida

Publicly Accessible Wearable Motion Databases for Human Gait Studies
Yue Luo, University of Florida | Sai Ouyang, University of Florida | Caroline Lockwood, University of Florida | Maria Ferraz, University of Florida | Boyi Hu, University of Florida

Smartphone Usage Pattern while Walking: A Survey on 441 Young Users in Korea
Yujin Kwon, Ulsan National Institute of Science and Technology | Eunjee Kim, Ulsan National Institute of Science and Technology | Misol Kim, Ulsan National Institute of Science and Technology

FRIDAY, OCTOBER 9, 2020 / 12:00 PM - 1:30 PM CENTRAL TIME

SESSION DETAILS

CE6: HUMAN FACTORS ISSUES AND CHALLENGES IN RESEARCH ON 'MANY-AGENT' CONTROL APPLICATIONS
Track: Cognitive Engineering & Decision Making
Session Type: Discussion Panel

Christopher Miller, Smart Information Flow Technologies | Julie Adams, Oregon State University | Shane Clark, | Stephanie Kane, | Karina Roundtree, Oregon State University | Phillip Walker

GS7: HFES TECHNICAL STANDARDS UPDATE
Track: General Sessions
Session Type: Discussion Panel

HFES Technical Standards Update
Robert Fox, General Motors | Rammohan Maikala, Providence Regional Medical Center | Providence St Joseph Health | Thomas Albin, High Plains Engineering Services | David Rempel, University of California, Berkeley | Judi See, Sandia National Laboratories |

PROGRAM **AGENDA**

FRIDAY, OCTOBER 9, 2020 / 12:00 PM - 1:30 PM CENTRAL TIME

SESSION DETAILS

HC9: USER-CENTERED DESIGN IN HEALTHCARE

Track: Health Care
Session Type: Lecture
Chair: See virtual meeting platform for Chair information

A Heuristic Evaluation of Usability for Environmental Control Units' Eye-Tracking Interfaces at Veterans Affairs Spinal Cord Injuries and Disorders Centers
Gabriella Hancock, California State University, Long Beach | Sam Anvari, California State University, Long Beach | Nicole Mok, CSULB | Aram Ayvazyan, CSULB | Xiaolu Bai, CSULB | Kelsey McCoy, CSULB | Matthew Nare, CSULB | Gregory Mather, CSULB | Carmen Machado, CSULB | Rebecca Chompff, CSULB | Amanda McBride, CSULB | Natalia Morales, CSULB

Acceptance of mHealth by Elderly Adults: A Path Analysis
Zhenzhen Xie, The University of Hong Kong | Calvin Or, The University of Hong Kong

Understanding Veteran Attitudes, Interests, and Needs Around Virtual Care Applications
Jason Saleem, University of Louisville | Brian Moon, Perigean Technologies | Emma Bross, Perigean Technologies | Shilo Anders, Vanderbilt University Medical Center | Brandon Conway, VHA Human Factors Engineering | Nancy Wilck, VHA Office of Connected Care | Kathleen Frisbee, VHA Office of Connected Care | Jennifer Herout, VHA Office of Connected Care

User and Task Analysis for Evaluation of Clinical Decision Support for Quality Improvement
Swaminathan Kandaswamy, Emory University | Dean Karavite, Children's Hospital of Philadelphia | Naveen Muthu, Children's Hospital of Philadelphia | Gerald Shaefferg, Children's Hospital of Philadelphia | Robert Grundmeier, Children's Hospital of Philadelphia | Marc Tobias, Phrase Health | Mike Zeidlhack, Phrase Health | Evan Orenstein, Emory University, Children's Hospital of Philadelphia

User-centered Requirements for Patient Fluid Intake Monitoring Support
Ellen Bass, Drexel University | Andrew Abbate, Pacific Science & Engineering Group | Rose Ann DiMaria-Ghalili, Drexel University | Yaman Noaiseh, Drexel University

Users' Needs in Designing a Mobile Dialysis Device. Insights from an Interview in a Mixed Methods Study
Auður Jónsdóttir, University of Washington | Larry Kessler, University of Washington | Seung Yeon Rim, University of Washington | Ji-Eun Kim, University of Washington

AI3: SYSTEM DESIGN AND TRAINING WITH HUMAN AI ROBOT TEAMING

Track: Human AI Robot Teaming (AI)
Session Type: Lecture
Chair: Eric Holder, US Army Research Laboratory
Co-Chair: Ruikun Luo, University of Michigan

Application of Cognitive Performance Modeling for Usability Evaluation of Emergency Medical Services In-Vehicle Technology
Junho Park, Texas A&M University | Johnathan McKenzie, Texas A&M University | Farzaneh Shahini, Texas A&M Univrsity | Marayam Zahabi, Texas A&M University

Developing an Integrated Energy System Interface for Electricity-Hydrogen Hybrid Nuclear Operations
Thomas Ulrich, Idaho National Laboratory | Roger Lew, University of Idaho | Ronald Boring, Idaho National Laboratory | Torrey Mortenson, Idaho National Laboratory | Jooyoung Park

Team Interaction Strategies for Human–Autonomy Teaming in Next Generation Combat Vehicles
Glenn Lematta, Arizona State University | Craig Johnson, Arizona State University | Eric Holder, US Army Combat Capabilities Development Command- Army Research Laboratory | Lixiao Huang, Arizona State University | Shawaiz Bhatti, Arizona State University | Nancy Cooke, Arizona State University

Team Synchronization and Individual Contributions in Coop-Space Fortress
Huao Li, University of Pittsburgh | Tianwei Ni, Carnegie Mellon University | Siddharth Agrawal, Carnegie Mellon University | Dana Hughes, Carnegie Mellon University | Michael Lewis, University of Pittsburgh | Katia Sycara, Carnegie Mellon University

The Good, The Bad, and The Ugly: Evaluating Tesla's Human Factors in the Wild West of Self-Driving Cars
Samineh Gillmore, University of Alabama in Huntsville | Nathan Tenhundfeld, University of Alabama in Huntsville

UTT: A Conceptual Model to Guide the Universal Design of Autonomous Vehicles
Stephen Carvalho, Clemson University | Suyash Ahire, Clemson University | Earl Huff, Clemson University | Julian Brinkley, Clemson University

FRIDAY, OCTOBER 9, 2020 / 12:00 PM - 1:30 PM CENTRAL TIME

SESSION DETAILS

OE6: OCCUPATIONAL ERGONOMICS 6
Track: Occupational Ergonomics
Session Type: Lecture
Chair: Steve Lavender, Ohio State University
Co-Chair: Suman Chowdhury, Texas Tech University

Changes in the Range of Head Flexion Rotation and Neck Muscle Activity after Prolonged Use of a Smartphone
Donghyun Song, Ulsan National Institute of Science and Technology | Eunjee Kim, Ulsan National Institute of Science and Technology | Yujin Kwon, Ulsan National Institute of Science and Technology | Hyorim Kim, Ulsan National Institute of Science and Technology | Gwanseob Shin, Ulsan National Institute of Science and Technology

Comparison of Bus Driving Posture in USA and India
Veda Rasmi Mallembakam, University of Windsor | Yang Lu, Pennsylvania State University | Andris Freivalds, Pennsylvania State University | Eunsik Kim, University of Windsor

Predicting Shoulder Joint Reaction Forces from 3D Body Kinematics: A Convolutional Neural Network Approach
Suman Chowdhury, Texas Tech University | Syed Tanzim Mubarrat, Texas Tech University | Ashish Nimbarte, West Virginia University

Spinal Compression Force During Manual Material Handling - Calculated in Jack Software Using Real or Predicted Human Motion
Zohar Potash, Ben Gurion University of the Negev | Yaar Harari, Northwestern University | Raziel Riemer, Ben Gurion University of the Negev

Survey of One-Handed Lifting in Manufacturing Industry: A Cross-Sectional Study of the BackWorks Study Cohort
Ruoliang Tang, Sichuan University-Pittsburgh Institute | Jay Kapellusch, University of Wisconsin – Milwaukee | Andrew Merryweather, University of Utah | Matthew Thiese, University of Utah | Hegmann Kurt, University of Utah | Ferguson Sue, Spine Research Institute, The Ohio State University | William Marras, Spine Research Institute, The Ohio State University | Ming-Lun Lu, NIOSH

PP1: VR, HMDS & VIGILANCE
Track: Perception and Performance
Session Type: Lecture
Chair: Barry Goettl, US Air Force Research Laboratory
Co-Chair: Nade Liang, Purdue University

Evaluating Impacts of Head Worn Displays on Teamwork in Emergency Response: Review of Challenges for the Field
Thomas Davidson, The University of Queensland | Penelope Sanderson, The University of Queensland

Experience with Varied Levels of Automation Influences User Response Speed
Lori Mahoney, Wright State University | Joseph Houpt, Wright State University |

How Can Head Worn Displays and Tablet Computers Affect Co-Located Work: A Laboratory-Based Exploratory Study
Isaac Salisbury, The University of Queensland | Felicity Burgmann, The University of Queensland | Penelope Sanderson, The University of Queensland

Movement Strategies in Virtual Reality: The Influence of Effort Costs and Target Depth
Logan Clark, University of Virginia | Sara Riggs, University of Virginia

The Role of Choice and Rest Break Length in a Vigilance Task
Grace Waldfogle, University of Central Florida | Allison Garibaldi, University of Central Florida | Israel Castellanos, University of Central Florida | James Szalma, University of Central Florida

The Vigilance Decrement: A Dynamical Systems Perspective
Michael Tolston, Air Force Research Laboratory | Eric T. Greenlee, Texas Tech University

PROGRAM **AGENDA**

FRIDAY, OCTOBER 9, 2020 / 12:00 PM - 1:30 PM CENTRAL TIME

SESSION DETAILS

S4: A SYSTEM'S VIEW OF EPIDEMIC RESPONSE
Track: Safety
Session Type: Discussion Panel

Alison Vredenburgh, Vredenburgh & Associates, Inc. | Kevin Weiner, National Education Policy Center | Rodrigo Daly Guris, The Children's Hospital of Philadelphia | Sreekanth Cheruki, UT Southwestern Medical Center

FRIDAY, OCTOBER 9, 2020 / 2:00 PM - 3:30 PM CENTRAL TIME

SESSION DETAILS

CE7: HUMAN-AGENT TEAMING AND TRUST
Track: Cognitive Engineering & Decision Making
Session Type: Lecture
Chair: Elizabeth Frost, Wright State University
Co-Chair: Pouria Salehi, Arizona State University

A Kalman Estimation Model of Human Trust in Supervisory Control of Robotic Swarms
Huao Li, University of Pittsburgh | Michael Lewis, University of Pittsburgh | Katia Sycara, Carnegie Mellon University

MazeWorld: Metrics for Human-Agent Teams
Elizabeth Cavanah, Iowa State University | Zachary Ford, Iowa State University | Angelica Jasper, Iowa State University, Human Computer Interaction | Jacklin Stonewall, Industrial Engineering, Iowa State University | Stephen Gilbert, Iowa State University | Michael Dorneich, Iowa State University

Modeling and Inferring Human Trust in Automation Based on Real-time Eye Tracking Data
Yidu Lu, University of Michigan | Nadine Sarter, University of Michigan

Real-Time Speech Workload Estimation for Intelligent Human-Machine Systems
Julian Fortune, Oregon State University | Jamison Heard, Rochester Institute of Technology | Julie Adams, Oregon State University

Trusting the X in XAI: Effects of Different Types of Explanations by a Self-driving Car on Trust, Explanation Satisfaction and Mental Models
Jan Maarten Schraagen, Univesrity of Twente | Pia Elsasser, University of Twente | Marleen Hof, University of Twente | Hanna Fricke, University of Twente | Fabyen Ragalmuto, University of Twente |

Using Function Allocation Methods to Inform Research Roadmaps: A Human-Robot Interaction Case Study for Medjool Date Thinning
Ellen Bass, Drexel University | Yael Salzer, Agricultural Research Organization (A.R.O) - Volcani Center

FRIDAY, OCTOBER 9, 2020 / 2:00 PM - 3:30 PM CENTRAL TIME

SESSION DETAILS

HC10: HEALTH CARE WORKFLOW

Track: Health Care
Session Type: Lecture
Chair: See virtual meeting platform for Chair information

Comparing Physician and Nurse Opinions of Team and Individual Handoffs: Does Role Influence Preference?
Emily Heuck, University of Illinois at Urbana-Champaign | Abigail Wooldridge, University of Illinois at Urbana-Champaign

Developing a Framework for Telehealth Integration into Clinical Workflow
Samuel Bonet, Texas A&M University | Farzan Sasangohar, Texas A&M University |

Exploring the Complexities of Trauma Care Flow and Documentation
Danita Patel, MedStar Health National Center for Human Factors In Healthcare | Zoe Pruitt, MedStar Health National Center for Human Factors In Healthcare | Ronald Romero Barrientos, MedStar Health National Center for Human Factors In Healthcare | Timothy McEwen, Charles River Analytics Inc. | Max Metzger, Charles River Analytics Inc. | Allan Fong, MedStar Health

Provider Burnout as It Relates to the Electronic Health Record and Clinical Workflow
Jason Saleem, University of Louisville | Meredith Price, University of Louisville | Jacob Read, University of Louisville | Ki-Hwan Bae, University of Louisville | Monica Gentili, University of Louisville | Jonathan Becker, University of Louisville | Eli Pendleton, University of Louisville

The Impact of Nurse Experience and Sequential Organ Failure Assessment on Nurses | Workflow in an Intensive Care Unit
Alireza Kasaie, University of Missouri | Jung Hyup Kim, University of Missouri | Wenbin Guo, University of Missouri

The Integration of Telemedicine into Clinicians' Workflow: A Scoping Review
Samuel Bonet, Texas A&M University | Farzan Sasangohar, Texas A&M University

AI4: MANAGING PERCEPTIONS AND RELATIONSHIPS IN HUMAN AI ROBOT TEAMING

Track: Human AI Robot Teaming (AI)
Session Type: Lecture
Chair: Joseph Lyons, US Air Force

A Brief Literature Review on Human Perceptions of Service Robots with a Focus on Healthcare
Algelia Burton, Arizona State University | Erin Chiou, Arizona State University | Robert Gutzwiller, Arizona State University |

A Mixed Analysis of Influencing Factors for Trust in a Risk-aware Autonomy Experiment
Lixiao Huang, Arizona State University | M. Cummings, Duke University | Masahiro Ono, California Institute of Technology |

Performance and Eye Metrics Correlates to Out-of-the-zone Sustained Attention in GradCPT
Wei Zhang, National Aeronautical Radio Electronics Research Institute | Yifan Zhang, Zhejiang University | Jie Xu, Zhejiang University |

Social Loafing with Robots – An Empirical Investigation
Linda Onnasch, Humboldt-Universität zu Berlin | Terpsichore Panayotidis, University of Surrey

The Effect of Anthropomorphism and Failure Comprehensibility on Human-Robot Trust
Eileen Roesler, TU Berlin | Julia I. Majer, Humboldt-Universität zu Berlin | Linda Onnasch, Humboldt-Universität zu Berlin |

The Impact of Team Training on Coordination and Trust Calibration in Human–Autonomy Teaming
Craig Johnson, Arizona State University | Mustafa Demir, Arizona State University | Alexandra Wolff, Human Systems Engineering | Nancy Cooke, Arizona State University |

OE7: WORKLOAD ISSUES AMONG COMMERCIAL CLEANING WORKERS
Track: Occupational Ergonomics
Session Type: Discussion Panel

Stephen Bao, Washington State Department of Labor and Industries, SHARP Program | Debra Milek, Department of General Internal Medicine, UW School of Medicine | Wonil Lee, Washington State Department of Labor and Industries | Andrew Ryan, School of Public Health, University of Minnesota | Jia-Hua Lin, Washington State Department of Labor and Industries, SHARP Program | Richard Goggins, Washington State Department of Labor and Industries | Cynthia Rivera, Sandia National Laboratories | Ben Walker, ManageMen, Inc. |

PP2: DRIVING AND EYE METRICS
Track: Perception and Performance
Session Type: Lecture
Chair: Nathan Tenhundfeld, University of Alabama in Huntsville

A New Perspective on CMS – Testing the Effect of Camera Displacement in a Realistic Lane-Change Task
Christoph Bernhard, Johannes Gutenberg-Universität Mainz | René Reinhard, Fraunhofer Institute for Industrial Mathematics ITWM | Heiko Hecht, Johannes Gutenberg-Universität Mainz

Driver Vigilance in Automated and Manual Driving
David Newton, Texas Tech University | Eric Greenlee, Texas Tech University | Patricia DeLucia, Rice University

Drivers' Gaze Behaviors are Influenced by Vehicle Position
Yuki Okafuji, Ritsumeikan University | Takahiro Wada, Ritsumeikan University | Toshihito Sugiura, Ritsumeikan University | Kazuomi Murakami, KOITO MANUFACTURING CO., LTD | Hiroyuki Ishida, KOITO MANUFACTURING CO., LTD.

Measuring Driver's Perceived Workload Using Fractal Dimension of Pupil Dilation
Jung Hyup Kim, University of Missouri

Modeling the Interaction with Automated Vehicles in Road Bottleneck Scenarios
Michael Rettenmaier, Technical University of Munich, Chair of Ergonomics | Klaus Bengler, Technical University of Munich, Chair of Ergonomics

What Can Eye Tracking Reveal About Situation Awareness? A Systematic Review
Nade Liang, Purdue University | Jing Yang, Purdue University | Ting Zhang, Purdue University | Brandon Pitts, Purdue University | Denny Yu, Purdue University

FRIDAY, OCTOBER 9, 2020 / 2:00 PM - 3:30 PM CENTRAL TIME

SESSION DETAILS

S5: SYSTEMS SAFETY
Track: Safety, Health Care
Session Type: Lecture
Chair: See virtual meeting platform for Chair information

Developing a Novel Operator Performance Measure for Procedural Tasks Based on Safety-II Perspective
Changwon Son, Texas A&M University | S. Camille Peres, Texas A&M University | Farzan Sasangohar, Texas A&M University

Dynamic Escape Signs for Safe Egress in School Shooter Situation
Michael Poole, Iowa State University | Stephen Gilbert, Iowa State University |

Efficiency-Thoroughness Trade-Off Characteristics of Air Traffic Controllers During Tower Operations
Tsubasa Takagi, Keio University | Miwa Nakanishi, Keio University

Incidents in the Great Outdoors: A Systems Approach to Understanding and Preventing Led Outdoor Accidents
Scott McLean, University of the Sunshine Coast | Caroline F Finch, Edith Cowan University | Lauren Coventon, University of the Sunshine Coast | Paul Salmon, Centre for Human Factors and Sociotechnical Systems, University of the Sunshine Coast

Proactively Identifying the Risks to Performance in Elite Sport Systems: The Application of a Novel Systems-based Risk Assessment Method in Women's Cycling
Adam Hulme, University of the Sunshine Coast | Scott McLean, University of the Sunshine Coast | Clare Dallat, University of the Sunshine Coast | Guy Walker, Heriot-Watt University | Patrick Waterson, Loughborough University | Neville Stanton, University of Southampton | Paul Salmon, University of the Sunshine Coast

Rancor Hybrid Energy System Microworld
Roger Lew, University of Idaho | Thomas Ulrich, Idaho National Laboratories | Ronald Boring, Idaho National Laboratory

SDVE1: SYSTEM DEVELOPMENT AND VIRTUAL ENVIRONMENTS
Track: System Development, Virtual Environments
Session Type: Lecture
Chair: See virtual meeting platform for Chair information

A Heuristic Evaluative Framework for Self-Regulated Learning Design
Rod Roscoe, Arizona State University | Stephanie McNicol, Arizona State University | Raghav Bhat, Arizona State University | Scotty Craig, Arizona State University

Balance-of-plant Computerized Operator Support System Implementation
Torrey Mortenson, Idaho National Laboratory | Ronald Boring, Idaho National Laboratorie | Thomas Ulrich, Idaho National Laboratory | Roger Lew, University of Idaho

Development and Testing of an Experimental Tool to Support Evaluation of Performance in Handling Competing Attentional Demands
Angelia Sebok, TiER1 Performance | Noah Adler, TiER1 Performance | Elijah Lofgren, TiER1 Performance | Jake McCord, TiER1 Performance | Kimberly Spahr, Colorado State University | Christopher Wickens, Colorado State University | Benjamin Clegg, Colorado State University

Development of Human-Out-of-the-Loop Participant Recruitment, Data Collection, Data Handling, and Participant Management System
Bethany Bracken, Charles River Analytics | Isaac Potoczny-Jones, Tozny, LLC | John Wolcott, Tozny, LLC | Eddie Raffaele, Tozny, LLC | Lucas Woodward, Tozny, LLC | Christopher Gogoel, Kryptowire | Nikos Kiourtis, Kryptowire | Brian Schulte, Kryptowire | Patricia Arean, University of Washington | Michael Farry, Charles River Analytics

Enabling Business-Driven Innovation through Human Factors Engineering in Nuclear Power Plants
Casey Kovesdi, Idaho National Laboratory | Katya Le Blanc, Idaho National Laboratory |

Leveling Up: Using the Tracer Method to Address Training Needs for Esports Players
Kaitlyn Roose, Michigan Technological University | Elizabeth Veinott, Michigan Technological University

PROGRAM **AGENDA**

FRIDAY, OCTOBER 9, 2020 / 4:00 PM - 5:30 PM CENTRAL TIME

SESSION DETAILS

PP3: DATA VISUALIZATION
Track: Perception and Performance
Session Type: Lecture
Chair: Manoosh Sadeghi, Texas A&M University

Color-Coded Map Overlay Augmentation for Unmanned Vehicle Sensor Management
Jacob Ehrenstrom, Air Force Research Laboratory | Gloria Calhoun, Air Force Research Laboratory | Elizabeth Frost, Air Force Research Laboratory | Jessica Bartik, Air Force Research Laboratory | Anna Lee Van Abel, Air Force Research Laboratory | Heath Ruff, InfoSciTex | Kyle Behymer, InfoSciTex

Does a Change in Modality Mitigate the Vigilance Decrement?
Tiffany Lui, Texas Tech University | Eric Greenlee, Texas Tech University | Patricia DeLucia, Rice University

Dynamic Ensembles versus Cones of Uncertainty: Visualizations to Support Understanding of Uncertainty in Hurricane Forecasts
Benjamin Clegg, Colorado State University | Jessica Witt, Colorado State University | Christopher Wickens, Colorado State University | CAP Smith, Colorado State University | Emily Laitin, Colorado State University | Amelia Warden, Colorado State University

Fitting Regression Lines to Scatterplots: The Role of Perceptual Heuristics Fitting Regression Lines to Scatterplots: The Role of Perceptual Heuristics
Douglas Gillan, North Carolina State University

Method to Create Perceptually Uniform Color Gradients with Optimized Color Differences between each Step for Data Visualization
Derek Millard, The University of Alabama in Huntsville | Samineh Gillmore, University of Alabama in Huntsville | Bradley Davis, US Army CCDC Data and Analysis Center

Psychometric Curves Reveal Three Mechanisms of Vigilance Decrement
Jason McCarley, Oregon State University | Yusuke Yamani, Old Dominion University

SD2: UNDERSTANDING HUMAN READINESS LEVELS
Track: System Development
Session Type: Discussion Panel

Judi See, Sandia National Laboratories | Holly Handley, Old Dominion University | Richard Craft, Sandia National Laboratories | George Salazar, National Aeronautics and Space Administration |

VE3: ME AND MY VE 2020
Track: Virtual Environments
Session Type: Alternative Format
Chair: Benjamin Goldberg, US Army Combat Capability Development Command - Soldier Center
Co-Chair: Randall Spain, North Carolina State University

Sarah Beadle, Clemson University Department of Psychology | Randall Spain, Center for Educational Informatics, NCSU | Benjamin Goldberg, U.S. Army Combat Capabilities Development Command - Soldier Center (CCDC SC) | Mahdi Ebnali, University at Buffalo, Department of Industrial and Systems Engineering | Shannon Bailey, Immertec | Brendan Ciccone, Immertec | Ragan Wilson, North Carolina State University | Summer Rebensky, Florida Institute of Technology | Meredith Carroll, Florida Institute of Technology | Winston Bennett, | Xueyu Hu, | Adam Reiner, University of Toronto | Holland Vasquez, University of Toronto | Abigail Wooldridge, University of Illinois at Urbana-Champaign | Lydia Lee, University of Illinois Urbana Champaign | Parth Verma, University of Illinois at Chicago | Heejin Jeong, University of Illinois at Chicago | Logan Gisick, Embry-Riddle Aeronautical University | Sarah Beadle, Clemson University Department of Psychology | John French, | Joseph Keebler, Embry-Riddle Aeronautical University |

GS9: HOW TO MAXIMIZE SUCCESS IN INDUSTRY AS A UX RESEARCHER
Track: General Sessions
Session Type: Discussion Panel

Christy Harper, End to End User Research; Melissa Meingast, Hewlett Packard Enterprise; Rochelle Edwards, Google; Amrita Maguir, Dell Technologies; Maya Green, Facebook; Tasha Valdez, ExxonMobil

POSTER **SESSIONS**

OCTOBER 7, 2020	
TIME	**SESSION NAME**
4:00 p.m. – 5:30 p.m.	**AGING** **Digital Home Assistants and Aging: Initial Perspectives from Novice Older Adult Users** Kenneth Blocker, University of Illinois at Urbana-Champaign | Travis Kadylak, College of Applied Health Sciences, University of Illinois Urbana-Champaign | Lyndsie Koon, University of Kansas | Christopher Kovac, University of Illinois at Urbana-Champaign | Wendy Rogers, University of Illinois Urbana-Champaign | Kenneth Blocker, University of Illinois at Urbana-Champaign **Effects of Auditory Cueing on Cadence and Gait Pattern** Andrei Carballo, Chapman University | Matthew Chang, Chapman University | Morgan Engelmann, Chapman University | Brian Hirmiz, Chapman University | Nicolette Lambright, Chapman University | Vivian Lee, Chapman University | Marla Lewis, Chapman University | Martin Nguyen, Chapman University | Matthew Gothong, Chapman University | Rahul Soangra, Chapman University **Usability Testing for the Operation of a Mobile Robotic Telepresence System by Older Adults** Samuel Olatunji, Ben Gurion University of the Negev | Andre Potenza, Orebro University | Andrey Kislev | Orebro University | Amy Loutfi, Orebro University | Yael Edan, Ben Gurion University of the Negev | Tal Oron-Gilad, Ben Gurion University of the Negev **AUGMENTED COGNITION** **Augmented Reality Procedure Assistance System for Operator Training and Simulation** Eugene Hayden, University of Toronto | Kang Wang, University of Waterloo | ChengJie Wu, Zhejiang University | Shi Cao, U. of Waterloo **Mental Workload of Novel, Simulated Advanced Driver Assistance Systems Use** Steven Chong, |Pamela Green, | John Lenneman, | Carryl Baldwin, Wichita State University **Changes in Lumbo-pelvic Coordination when Carrying an ergonomically-enhanced Versus a Regular Backpack** Cazmon Suri, University of Kentucky | Iman Shojaei, University of Kentucky | Babak Bazgari, University of Kentucky Technology Canada | Alexandre Williot, Université Laval | François Vachon, École de psychologie | xploratoin of human-Sébastien Tremblay, Université Laval

POSTER **SESSIONS**

OCTOBER 7, 2020	
TIME	**SESSION NAME**
4:00 p.m. – 5:30 p.m.	**COGNITIVE ENGINEERING & DECISION MAKING** **A Brief Review of Frequently Used Self-Report Measures of Trust in Automation** Spencer Kohn, George Mason University | Molly Kluck, George Mason University | Tyler Shaw, George Mason University **After You: Merging at Highway On-Ramps** Tanja Stoll, Ulm University | Lucas Weihrauch, Ulm University | Martin Baumann, Ulm University **Attention Allocation to Physically Separate Task and Situation Displays in a Command and Control Setting** Hely Golan, R | Avi Parush, Israel Institute of Technology | Eli Jaffe, Magen David Adom **Comparing Two Decision Support Modes Using the Cognitive Shadow Online Policy-Capturing System** Katherine Labonté,, Université Laval | Daniel Lafond, Thales Research and Technology Canada | Aren Hunter, Defence Research and Development Canada | Heather F. Neyedli, Dalhousie University | Sébastien Tremblay, Université Laval **Does One Bad Machine Spoil the Bunch?: A Review of Trust in Multiple-Component Systems** Jeremy Lopez, Clemson University | Richard Pak, Clemson University **For Whom the Tale's Told: Towards a Multidimensional Model of Targeted Narrative Persuasion in Information Operations** Jihye Song, University of Central Florida | Stephen Fiore, University of Central Florida **Impact of Perceived Agent Expertise on Trust in Computer Agent Recommendations** William Sharp, George Mason University | Marc Sebrechts, The Catholic University of America **Real-Time Gaze-Aware Cognitive Support System for Security Surveillance** Alexandre Marois, Thales Research and Technology Canada | Daniel Lafond, Thales Research and Technology Canada | Alexandre Williot, Université Laval | François Vachon, École de psychologie | xploratoin of human-Sébastien Tremblay, Université Laval **COMMUNICATIONS** **Exploration of Human-Mediated Interruption Strategies via Spoken Information Removal** Savannah Seals, Air Force Research Laboratory | Nia Peters, Air Force Research Laboratory | Nina Pryor, Air Force Research Laboratory | **TRACK: COMPUTERS SYSTEMS** **Embedded Versus Horizontal UX Research Teams: Which May Best Suit You?** Olga Kramarova, Google (Adecco) | Yodit Tefera, Google (Adecco) | Tina Tseng, Google (Adecco) | Bridget Huber, Google | Ryle Scribner, Google (Adecco) | Rochelle Edwards, Google | **Observations on the Field of UX Research** Rochelle Edwards, Google | Bridget Huber, Google | Olga Kramarova, Google (Adecco) |

POSTER **SESSIONS**

OCTOBER 7, 2020	
TIME	**SESSION NAME**
4:00 p.m. – 5:30 p.m.	**TRACK: EDUCATION** **Differentiated Instruction further Realized through Teacher-Agent Teaming** Geoff Musick, Clemson | Divine Maloney, Clemson | Christopher Flathmann, Clemson University | Nathan McNeese, Clemson University | Jamiahus Walton, Clemson University | **Interdisciplinary Human Factors Curricula for Independent Study** Hamza Khammash, Rochester Institute of Technology | Esa Rantanen, Rochester Institute of Technology | James Hall, Rochester Institute of Technology | **ENVIRONMENTAL DESIGN** **Adaptation of Heuristic Evaluations for the Physical Environment** Roslyn Shanklin, Rice University | Philip Kortum, Rice University | Claudia Acemyan, Rice University | **Sustainable Post-Occupancy Evaluation Survey (SPOES): An Approach to Human Factors in Minnesota State-funded Buildings** Abimbola Asojo, University of Minnesota | Hoa Vo, University of Minnesota | Suyeon Bae, University of Missouri | **The Influence of Lighting Conditions on Lower Limb Muscle Activation during Balance Recovery** Jessia Pitts, Michigan Technological University | Isaac Flint, Michigan Technological University | Adison Cook, Michigan Technological University | Kevin Trewartha, Michigan Technological University | Alicia DenHerder, Central Michigan University | Carolyn Duncan, Michigan Technological University | **Use of the International Classification of Functioning, Disability and Health to Measure Public Transportation Barriers among Older Adults** Patrick Schuler, University of Michigan | Clive D'Souza, Center for Ergonomics, University of Michigan | **FORENSICS PROFESSIONAL** **Engineering Approach to Unintentional Firearm Discharges** Richard Stone, Iowa State University | Fatima Mgaedeh, Iowa State University | Colten Fales, Iowa State University | Cong Xu, Iowa State University | Gary Backous, Story County Sheriff's Office | **GENERAL SESSIONS** **The Accuracy of Interrater Reliability Estimates Found Using a Subset of the Total Data Sample: A Bootstrap Analysis** Miriam Armstrong, Texas Tech University | Keith Jones, Texas Tech University |

POSTER **SESSIONS**

OCTOBER 7, 2020	
TIME	**SESSION NAME**
4:00 p.m. – 5:30 p.m.	**HEALTH CARE** **Coordinating Nurse Response to Alarms in High-reliability Teams** Carmen Diaz, Kellogg School of Management (Northwestern University) | **Facilitating the Practice of Biofeedback Via Mobile Applications and Wearable Devices for Self-Management of Mental Health** Sudeep Hegde, Texas A&M University | Karim Zahed, Texas A&M University | Changwon Son, Texas A&M University | Carl Markert, Texas A&M University | Farzan Sasangohar, Texas A&M University | **Factors Influencing Users' Perceived Value of Electronic Health Record Patient Portals** David Neyens, Clemson University | Rong Yin, Clemson University | Katherine Law, Mayo Clinic | **Feedback Modalities in Brain–Computer Interfaces: A Systematic Review** Wakana Ishihara, San José State University | Dan Nathan-Roberts | San José State University | Mark Yarborough, University of California Davis | Sheryl Ehrman, San José State University | Karen Moxon, University of California Davis | Tina Panontin, San José State University | **Head-Mounted Display Virtual Reality in Disease Treatment: A Systematic Review and Meta-Analysis** Jiayin Chen, The University of Hong Kong | Zhenzhen Xie, The University of Hong Kong | Calvin Or, The University of Hong Kong | **Joy in the Workplace: A Scoping Review of Positive Emotion and Electroencaphalogram** Yaqoub Yusuf, Mayo Clinic | Jodi Boutte, Baylor Scott and White Research Institute | Lloyd Asante, Mayo Clinic | Emma Fortune, Mayo Clinic | Renaldo Blocker, Mayo Clinic | **Mobile Environment for Developing User Situation Awareness (MEDUSA): Training for Healthcare Professionals** Steve Kass, University of West Florida | Brian Eddy, University of West Florida | Thomas Reichherzer, University of West Floirda | Jill Van Der Like, University of West Florida | Dean Jones, | Alexander King, | Branden Mazour, | Ryan McCourt, | **Negotiating Time and Space: Investigating the Pediatric Code Cart Augmented Reality Application** Widya Ramadhani, University of Illinois at Urbana-Champaign | Abigail Wooldridge, University of Illinois at Urbana-Champaign | Jyotika Roychowdhury, University of Illinois at Urbana-Champaign | Ashley Mitchell, University of Illinois at Urbana-Champaign | Keith Hanson, University of Illinois College of Medicine at Peoria | Elsa Vazquez-Melendez, University of Illinois College of Medicine at Peoria | Harleena Kendhari, University of Illinois College of Medicine at Peoria | Nadia Shaikh, University of Illinois College of Medicine Peoria | Teresa Riech, University of Illinois College of Medicine at Peoria | Matthew Mischler, University of Illinois College of Medicine at Peoroa | Sara Krzyzaniak, University of Illinois College of Medicine | Ginger Barton, OSF HealthCare Children's Hospital of Illinois | Kyle Formella, OSF HealthCare | Zachary Abbott, Jump Simulation Center, OSF Healthcare | John Farmer, OSF HealthCare | Rebecca Ebert-Allen, OSF Healthcare System | Trina Croland, University of Illinois College of Medicine at Peoria | **Nursing's Role in Translating Safe Communication Practices to Clinical Trial Management** Elizabeth Johnson, The University of Arizona | Jane Carrington, The University of Florida | Jessica Rainbow, The University of Arizona | **Process Risks In Perioperative Medication Delivery** Sarah Coppola, Johns Hopkins University | Patience Osei, Johns Hopkins University | Ayse Gurses, Johns Hopkins University | Myrtede Alfred, Medical University of South Carolina | David Neyens, Clemson University | Ken Catchpole, Medical University of South Carolina | Anjali Joseph, Clemson University | Catherine Tobin, Medical University of South Carolina | Joshua Biro, Clemson University | Maya Rucks, Clemson University | James Abernathy, III, Johns Hopkins University |

OCTOBER 7, 2020	
TIME	**SESSION NAME**
4:00 p.m. – 5:30 p.m.	**HEALTH CARE** **Robotic Assisted Surgery: The Gap between Challenges and Solutions** Falisha Kanji, Cedars-Sinai Medical Center | Kate Cohen, Cedars-Sinai Medical Center | Tara Cohen, Cedars-Sinai Medical Center | Myrtede Alfred, Medical University of South Carolina | Daniel Shouhed, Cedars-Sinai Medical Center | Jennifer Anger, Cedars-Sinai Medical Center | Ken Catchpole, Medical University of South Carolina | **Understanding Exercise Challenges and Barriers for Older Adults with Mobility Disabilities** Qiong Nie, UIUC | Lyndsie Koon, University of Kansas | Madina Khamzina, UIUC | Wendy Rogers, University of Illinois Urbana-Champaign | **Usability Challenges with EHRs During Pre-Rounding in the Pediatric Acute Care Department** Jawad Alami, University of Virginia | Stephen Borowitz, University of Virginia | Sara Riggs, University of Virginia | **Visual Blood Loss Estimation Accuracy: Directions for Future Research Based on a Systematic Literature Review** Rachel Phillips, Old Dominion University | Marc Friberg, Linkoping University | Mattias Lantz Cronqvist, Linköping University | Carl-Oscar Jonson, Center for Disaster Medicine and Traumatology | Erik Prytz, Linköping University | **HUMAN AI ROBOT TEAMING (AI)** **Bringing the Automation-Related Complacency Scale into the 21st Century** Kristianna Radley, Moog Medical Device Group | Frank Drews, University of Utah | **Designing Human-Autonomy Teaming Experiments Through Reinforcement Learning** Beau Schelble, Clemson University | Lorenzo-Barberis Canonico, Clemson University | Nathan McNeese, Clemson University | Jack Carroll, Clemson University | Casey Hird, Clemson University | **Exploring the Effect of Visual Information Degradation on Human Perception and Performance in a Human-telerobot System** Richard Stone, Iowa State University | Thomas Schnieders, Iowa State University | Minglu Wang, Iowa State University | Esraa Abdelall, Jordan University of Science and Technology | **Mismatch Investigation on Workstation for a Jangbogo Class Submarine by Korean Anthropometric Dimensions** Joong Hee Lee, Seoul National University | Jihwan Lee, Seoul National University | Chan Hyeok Yun, Seoul National University | Namwoo Cho, Seoul National University | May Jorella Lazaro, Seoul National University | Myung Hwan Yun, Seoul National University | **What's the Difference? Reconciling Knowledge Structure Concepts to Aid AI Development for Human-Machine Teaming** Olivia Newton, University of Central Florida | Stephen Fiore, University of Central Florida | **HUMAN PERFORMANCE MODELING** **Examining Methods for Combining Speed and Accuracy in a Go/No-go Vigilance Task** Shane Mueller, Michigan Technological University | Lamia Alam, Michigan Technological University | Gregory Funke, Michigan Technological University | Anne Linja, Michigan Technological University | Tauseef Ibne Mamun, Michigan Technological University | Samantha Smith, Michigan Technological University | **Understanding Human Movement Patterns within Cislunar Habitats** Harry Litaker, Leidos/NASA | Omar Bekdash, KBR/NASA | Steve Chappell, KBR/NASA | Kara Beaton, KBR/NASA | Michael Gernhardt, NASA | **Validating Human Performance Models: Building a House without Bricks** Dick Steinberg, Raytheon Company | Alice Jackson, Raytheon Company | Jade Driggs, |

POSTER **SESSIONS**

OCTOBER 7, 2020	
TIME	**SESSION NAME**
4:00 p.m. – 5:30 p.m.	**INDIVIDUAL DIFFERENCES IN PERFORMANCE** **Attentional Control and Performance Across Increasing Degrees of Unreliable Automation** Claire Textor, Clemson University | Richard Pak, Clemson University | **Does a New Version of the Direction Orientation Task Measure Spatial Ability?** Jacqueline Sweet, Naval Research Laboratory | Joseph Coyne, Naval Research Laboratory | Nathan Herdener, Naval Research Laboratory | Anthony Ries, U.S. Army Research Laboratory | **Exploring Sex Differences in the Role of Social Support on Vigilance Tasks** Allison Garibaldi, University of Central Florida | James Szalma, University of Central Florida | Grace Waldfogle, University of Central Florida | **Gender Differences in Perceptions of Technology, Technology Readiness, and Spatial Cognition** Dawn Blasko, Pennsylvania State University, Behrend College Ps | Heather Lum, Embry-Riddle Aeronautical University | John Campbell, Pennsylvania State University, Behrend College | **Knowledge and Experience in Video Game Play: Understanding Individual Differences and Mental Model Transfer Across Game Genres** Rhyse Bendell, University of Central Florida | Jessica Williams, University of Central Florida | Stephen Fiore, University of Central Florida | Florian Jentsch, University of Central Florida | **Patterns of Language Processing among English Monolingual and Bilingual Speakers** Salim Adam Mouloua, University of Central Florida | Zachary Peart, University of Central Florida | Mustapha Mouloua, University of Central Florida | **Personality Assessment as a Measure of Nonhuman Mental Capacities: A Study in Anthropomorphism** Briana Sobel, University of Central Florida | Valerie Sims, University of Central Florida | **Transportation Security Administration (TSA) Aptitude Alignment Job Role Study (JRS) for Travel Document Checker (TDC) Position** Kristopher Korbelak, Department of Homeland Security/Transportation Security Administration | Jeffrey Dressel, Currently Federal Aviation Administration (FAA) and this work Performed while at TSA | Emily Sanders, Deloitte | Jenny LaFreniere, Deloitte | Anson Carter, Deloitte | **INTERNET** **Dear Diary: Conducting Diary Studies with Participants with Visual Impairments** Earl Huff, Clemson University | Kwajo Boateng, Clemson University | Julian Brinkley, Clemson University | **Face-to-Face and Online Friendships: Examining Differences in Trust and Distrust Based on Modality** Andrew Griggs, II, Embry-Riddle Aeronautical University | Emily Rickel, Embry-Riddle Aeronautical University | Elizabeth Lazzara, Embry-Riddle Aeronautical University | Christina Frederick, Embry-Riddle Aeronautical University | **OCCUPATIONAL ERGONOMICS** **A Depth Camera-based Full-body Reconstruction Method for Body Pose Training in Occupational Safety** Li Li, Fitts Department of Industrial & Systems Engineering, NCSU | Ken Chen, Fitts Department of Industrial & Systems Engineering, NCSU | Karen Chen, Fitts Department Industrial and Systems Engineering, North Carolina State University | Xu Xu, Fitts Department of Industrial & Systems Engineering, NCSU | **Accuracy of Estimating Hand Location during Lifting Using Five Wearable Motion Sensors** Menekse Barim, NIOSH | Ming-Lun Lu, NIOSH | Grant Hughes, Focus Motion Health | Shuo Feng, Focus Motion | Marie Hayden, NIOSH | Dwight Werren, NIOSH |

OCTOBER 7, 2020	
TIME	**SESSION NAME**
4:00 p.m. – 5:30 p.m.	**OCCUPATIONAL ERGONOMICS** (CONTINUED) **Asymmetric Load Carriage at Shoulder Height affects Temporal Gait Characteristics among Food Service Workers** Espino Christopher, Chapman University | Robin Faustino, Chapman University | Tiffany Franco, Chapman University | Angel Reign Galvan, Chapman University | Matthew Gothong, Chapman University | Ennis Khaleq, Chapman University | Cody Occhino, Chapman University | Rahul Soangra, Chapman University | **Biochemical and Physiological Dynamics in Ligament Injury & Healing** Amjad Ramahi, UC Davis | Fadi Fathallah, UC Davis | Thomas Jue, UC Davis | **Computer Vision Algorithm to Identify High Force Exertions** Hamed Asadi, Purdue University | Guoyang Zhou, | Vaneet Aggarwal, | Denny Yu, Purdue University | **Effects of Break Schedule on Neck Muscle Fatigue** Pramiti Sarker, Iowa State University | Hamid Norasi, Iowa State University | Jordyn Koenig, Iowa State University | Susan Hallbeck, Mayo Clinic | Gary Mirka, Iowa State University | **Ergonomic Assessment of Low Back Loading Pattern during Occupational Lifting Task in a Lower Limb Amputee: Minimizing Injury Risk** Chandrasekaran Jayaraman, Shirley Ryan Ability Lab | Chaitanya Mummidsetty, Shirley Ryan Ability Lab | Matt McGuire, Shirley Ryan Ability Lab | Shenan Hoppe-Ludwig, Shirley Ryan Ability Lab | Arun Jayaraman, Northwestern University / Shirley Ryan AbilityLab | **Hand Posture and Force Estimation using Surface Electromyography and an Artificial Neural Network** Mengcheng Wang, University of California, Berkeley | Chuan Zhao, Qingdao University, Qingdao | Alan Barr, UC Ergonomics Program | Suihuai Yu, Northwestern Polytechnical University | Jay Kapellusch, University of Wisconsin – Milwaukee | Carisa Harris-Adamson, University of California, Berkeley | **Investigating Two Variables in a Manual Dexterity Test to Provide Suggestions for Workers in General Industries** Shun Yao, University of Michigan | Shengping Zhao, College of Safety Science and Engineering, Nanjing Tech University | **Predicting the Cross-Sectional Areas of Low Back Intervertebral Discs: Archived Medical Record versus MRI Scans from Asymptomatic Subjects** Ruoling Tang, Sichuan University-Pittsburgh Institute | Celal Gungor, Izmir Katip Celebi University | Richard Sesek, Auburn University | Sean Gallagher, Auburn University | Gerard Davis, Auburn University | Kenneth Bo Foreman, University of Utah | **Prevention and Intervention of Upper Respiratory Tract Infections (URTIs) with Assistance of Wearable Sensor Technology** Tianqi Smith, State University of New York at Binghamton | Enzo Sacchetti, Binghamton University | Mohammed Mahyoub, | **Surface Inclination Influences Fall Risk and Lower Extremity Joint Moments During Walking** Rachel Kling, Chapman University | Alex Chung, Chapman University | Luke Cassedy, Chapman University | Courtney Cox, Chapman University | Emily Kimbro, Chapman University | Jim Grodzielanek, Chapman University | Stephen Ayres, Chapman University | Shireen Hosseini, Chapman University | Michael Shiraishi, Chapman University | Rahul Soangra, Chapman University |

POSTER **SESSIONS**

OCTOBER 7, 2020	
TIME	**SESSION NAME**
4:00 p.m. – 5:30 p.m.	**OCCUPATIONAL ERGONOMICS** (CONTINUED) **Updates on NORA Musculoskeletal Health Cross-Sector Council Activities** David Rempel, University of California, Berkeley | Scott Schneider, Formerly with the Laborers' Health and Safety Fund of North America | Sean Gallagher, Auburn University | Sheree Gibson, Sheree L Gibson, CPE | Susan Kotowski, University of Cincinnati, College of Allied Health Sciences, Department of Rehabilitation, Exercise, and Nutrition Sciences | Ming-Lun Lu, NIOSH | Robert Fox, General Motors | Ann Marie Dale, Washington University in St. Louis | Gary Orr, USDOL | Ninica Howard, SHARP Program, WA State Department of Labor & Industries | Ben Zavitz, Ergo Human Performance LLC | Blake McGowan, VelocityEHS | Humantech | Steven Wurzelbacher, NIOSH Center for Workers' Compensation Studies | Kelsey McCoskey, US Army Public Health Center | Lida Orta-Anes, University of Puerto Rico | **PERCEPTION AND PERFORMANCE** **Beyond the Vigilance End-Spurt with Event-Related Potentials** Megan Morris, Air Force Research Laboratory | Ashley Haubert, University of Dayton Research Institute | Glenn Gunzelmann, Air Force Research Laboratory | **Does the Size-arrival Effect Occur with an Active Collision-avoidance Task in an Immersive 3D Virtual Reality Environment?** Patricia DeLucia, Rice University | Adam Braly, Rice University | Bria Savoy, Fisk University | **Draining the Brain: The Effects of Four Fatigue Domains on Executive Function and Prefrontal Cortex** Salim Mouloua, University of Central Florida | Peter Hancock, University of Central Florida | Corey Bohil, University of Central Florida | Daniel McConnell, University of Central Florida | **Exploring the Effect of Virtual Robot Acceleration on Perceived Competitiveness/ Cooperativeness, Animacy, and Intelligence** Jordan Sasser, University of Central Florida | Fernando Montalvo, University of Central Florida | Rhyse Bendell, University of Central Florida | Peter Hancock | University of Central Florida | Daniel McConnell, University of Central Florida | **How Trust is Defined and Its Use in Human-Human and Human-Machine Interaction** Alexandra Kaplan, University of Central Florida | Theresa Kessler, University of Central Florida | Peter Hancock, University of Central Florida | **Investigating the Effects of Interruptions and Reliable Cueing on Change Detection within Dynamic Scenes** Kimberly Perry, Old Dominion University | Mark Scerbo, Old Dominion University | Sarah Powers, Old Dominion University | **Pre-task Training for Vigilance Using a Video Game-based Simulation Task** Nicolas Uszak, University of Central Florida | James Szalma, University of Central Florida | **Reported Order of Importance Does Not Predict Fixation Order when Viewing Driving Scenes** Anastasia Diamond, Priority Designs | Alex Chaparro, Embry-Riddle Aeronautical University | **Spatial Ability Stress Test for Screening and Selection: The Development of SCOUT-R** Noelle Brown, Naval Research Laboratory | Ciara Sibley, Naval Research Laboratory | Cyrus Foroughi, Naval Research Laboratory | Joseph Coyne, Naval Research Laboratory | Nathan Herdener, Naval Research Laboratory | Henry Phillips, NAMI | Kenneth King, NAMI |

POSTER **SESSIONS**

OCTOBER 7, 2020	
TIME	**SESSION NAME**
4:00 p.m. – 5:30 p.m.	**PERCEPTION AND PERFORMANCE** (CONTINUED) **Training Novices to Discriminate Retinal Diseases Using Perceptual Learning** Elnaz Amiri, Contractor at Google | Evan Palmer, San José State University Faculty | Patricia Sha, Carl Zeiss Meditec, Inc. | **Vigilance in 3-D Audio: Spatialized Auditory Signals Do Not Protect Against the Vigilance Decrement** Lucas Hess, Texas Tech University | Eric Greenlee, Texas Tech University | Brian Simpson, | Victor Finomore, | **Where Two Ends Meet: Operator and Stakeholder Perceptions of Procedures** Anjelica Mendoza, Texas A&M University | Sin-Ning Liu, Texas A&M University | Stefan Dumlao, Texas A&M University | Joseph Hendricks, Texas A&M University Health Science Center | Changwon Son, Texas A&M University | Farzan Sasangohar, Texas A&M University | S. Camille Peres, Texas A&M University | **PRODUCT DESIGN** **Beauty and the Beastly Search: Finding Luxury in a Product Hierarchy** Mark Chignell, University of Toronto | Carmen Branje, Loblaw Digital | Yuhong Yang, University of Toronto | **Cross-cultural Difference in Product Preference in Consumer Review-based Text Mining Methods: A Case Study on Smart Band** Cai Wang, Seoul National University | Myung Hwan Yun, Seoul National University | **Optimal Placement of Anti-Counterfeiting Indicators** Elizabeth Sterling, University of South Dakota | Doug Peterson, University of South Dakota | **Peanut Butter Jar Redesign from a Human Factors Standpoint** Thomas Schnieders, Iowa State University | Richard Stone, Iowa State University | Olivia Janusz, Iowa State University | Nicole Kittleson, Iowa State University | K Sajkkumar, Iowa State University | **Tread Patterns and the Effect on Basketball Player Slippage** Colten Fales, Iowa State University | Richard Stone, Iowa State University | Daniel Van Groningen, Iowa State University | Braden Westby, Iowa State University | **Load Carriage affects Kinematics during Ingress and Egress on Simulated Travelators** Alexa Charbonneau, Chapman University | Ben Garson, Chapman University | Fiona Bisoffi, Chapman University | Stephanie Esparza, Chapman University | Miral Bhakta, Chapman University | Luke Bailey, Chapman University | Rahul Soangra, Chapman University | **SAFETY** **Rail Safety: Examining the Effect of Driving Experience and Type of Crossing on Safety Concerns** Anne Linja, Michigan Technological University | Pasi Lautala, Michigan Technological University | David Nelson, Michigan Technological University | Elizabeth Veinott, Michigan Technological University | **SURFACE TRANSPORTATION** **Assessing the Development of Operator Trust in Automation: A Longitudinal Study of an Autonomous Campus Shuttle** Margaret Fowler, Texas A&M Transportation Institute | Farzan Sasangohar, Texas A&M University | Robert Brydia, Texas A&M Transportation Institute | **Assessing the Effect of Countdown Featured TOR Signal on Drivers in Automated Driving Mode Change** Hyunjoo Park, University of Michigan-Dearborn | HyunJae Park, University of Michigan-Dearborn | Sang-Hwan Kim, University of Michigan-Dearborn |

POSTER **SESSIONS**

OCTOBER 7, 2020	
TIME	**SESSION NAME**
4:00 p.m. – 5:30 p.m.	**SURFACE TRANSPORTATION** (CONTINUED) **Driver Response Times to Side Road Path Intrusions from SHRP-2 Naturalistic Database** Swaroop Dinakar, Crash Safety Research Center, LLC | Jeffrey Muttart, Crash Safety Research Center, LLC | Jeffry Suway, | Jim Marr, | Alexander Enes, | Darlene Edewaard, | Alexander Enes, | **Driver Stopping Behavior at Stop-controlled Intersections with Sightline Limitations** Branden Kolarik, Exponent, Inc. | Kyra Phillips, Exponent, Inc. | Jacqueline Zimmermann, Exponent, Inc. | David Krauss, Exponent, Inc. | **Effectiveness of the Soft-Safety Driver Alerts: Measurements, Alert Types, and Driver States** Zhengming Zhang, Indiana University-Purdue University Indianapolis | Renran Tian, Indiana University-Purdue University Indianapolis | **Enacting into Reality: Using User Enactment to Explore the Future of Autonomous Vehicle Design** Aaron Gluck, Clemson University | Earl Huff, Jr. Clemson University | Mengyuan Zhang, Clemson University | Julian Brinkley, Clemson University | **Effects of Audio Learning on Semi-Autonomous Driving Safety** Michael Chen, Eastern Kentucky University | Megan Thomas, Eastern Kentucky University | **How Do Drivers Hold Their Phone? Age, Prevalence, & Handedness** Trey Roady, Seeing Machines | Kyle Wilson, Seeing Machines | Jonny Kuo, Seeing Machines | Mike Lenné, Seeing Machines | **Human-Machine Interfaces for Handover From Automated Driving Systems: A Literature Review** Richard Greatbatch, Virginia Tech | Hyungil Kim, Oakland University | Zachary Doerzaph, Virginia Tech Transportation Institute | Robert Llaneras, Virginia Tech Transportation Institute | **Investigate Drivers' Trust in Autonomous Vehicles Decisions of Lane Changing Events** Jackie Ayoub, University of Michigan | Feng Zhou, University of Michigan | **Judging Intentionality in Ambiguous Driving Scenarios: Did They Do That to Me or Just a Mistake?** Yi-Ching Lee, George Mason University | **Look, Ma, No Hands! A Preliminary Study of Educational Interventions Aimed at Setting Realistic Expectations of Semi-autonomous Vehicle Technology** Shruti Amre, Michigan Technological University | Kelly Steelman, Michigan Technological University | **Pink Elephants on the Road: Visual Illusions and Distortions when Driving during Significant Sleep Deprivation** Curtis Craig, University of Minnesota | Nichole Morris, University of Minnesota | Katelyn Schwieters, University of Minnesota | Conrad Iber, University of Minnesota Medical School | **Preliminary Investigation of System Transparency and System Failure on Driver Trust in Partial Vehicle Automation** Jieun Lee, University of Tsukuba | Genya Abe, Japan Automobile Research Institute | Kenji Sato, Japan Automobile Research Institute | Makoto Itoh, University of Tsukuba | **Preventing Drowsy Driving Crashes among Night Shift Nurses | An Evaluation of Education and Technological Interventions** Alec Smith, Texas A&M University | Anthony McDonald, Texas A&M | Farzan Sasangohar, Texas A&M University |

OCTOBER 7, 2020	
TIME	**SESSION NAME**
4:00 p.m. – 5:30 p.m.	**SURFACE TRANSPORTATION** (CONTINUED) **Real-World Use of Partially Automated Driving Systems and Driver Impressions** Hyungil Kim, Oakland University | Miao Song, Virginia Tech Transportation Institute | Zachary Doerzaph, Virginia Tech Transportation Institute | **Some Characteristics of Mental Models of Advanced Driver Assistance Systems: A Semi-Structured Interviews Approach** Michael Nees, Lafayette College | Nithya Sharma, Lafayette College | Karli Herwig, Lafayette College | **The Evaluation of Seat - Comfort, Body Discomfort and Seat Vibration Performance in a Dynamic Testing Environment** Jeong Ho Kim, Oregon State University | Wu Pan-Zagorski, Lear Corporation | Missy Pereny, Lear Corporation | Kiana Kia, Oregon State University | Peter Johnson, University of Washinton | **The Impact of Mental States on Semi-autonomous Driving Takeover Performance: A Systematic Review** Gaojian Huang, Purdue University | Christine Petersen, Purdue University | Brandon Pitts, Purdue University | **SYSTEM DEVELOPMENT** **Evaluating the Utility of Human Readiness Levels (HRLs) with Human System Integration Assessments (HSIAs)** Holly Handley, Old Dominion University | Pamela Savage-Knepshield, Army Futures Command, CCDC DAC | **Integrating Electronic Performance Monitoring with Digital Procedure Systems: Considerations and Psychological Outcomes** Anjelica Mendoza, Texas A&M University | Stefan Dumlao, Texas A&M University | **TRAINING** **Examining Enhanced Learning Diagnostics in Virtual Reality Flight Trainers** Gregory McGowin, University of Central Florida | Zerong Xi, University of Central Florida | Olivia Newton, University of Central Florida | Jihye Song, University of Central Florida | Gita Sukthankar, University of Central Florida | Stephen Fiore, University of Central Florida | Kevin Oden, Lockheed Martin, Rotary and Mission Systems | **Exploring the Encoding Specificity Principle and Context-Dependent Recognition in Virtual Reality** Jason Parker, University of Central Florida | Alexandra Kaplan, University of Central Florida | William Volante, University of Central Florida | Julian Abich IV, Quantum Improvements Conculting | Valerie Sims, University of Central Florida | **Stress Management and Air Traffic Control Trainees: Development and Evaluation of a New Training Course** Jamie Barrett, Federal Aviation Administration | Brett Torrance, Cherokee Nation 3-S | Michelle Bryant, MITRE | Linda Pierce, Retired, Federal Aviation Administration | Julia Buck, CSU Department of Psychology | **The Effect of Feedback Type on Perception of Performance** Jamiahus Walton, Clemson University; Stephen Gilbert, Iowa State University

POSTER **SESSIONS**

OCTOBER 7, 2020	
TIME	**SESSION NAME**
4:00 p.m. – 5:30 p.m.	**USABILITY AND SYSTEM EVALUATION** **Emotion Task Analysis: Proposing a Tool for the Assessment of Emotional Components in a Task** Aaron Crowson, North Carolina State University | Michael Wilkinson, North Carolina State University | Richard Wagner, North Carolina State University | Ragan Wilson, North Carolina State University | Douglas Gillan, North Carolina State University | **Ergonomic Redesign of the Coca Cola Freestyle Machine User Interface to Improve Accessibility** Rebecca Hannan, Binghamton University | Samantha Laform, Binghamton University | Kate Boyle, Binghamton University | Samuel Danziger Binghamton University | Tianqi Smith, State University of New York at Binghamton | Mohammed Mahyoub, | **Exploring User Information Needs in Online Pet Adoption Profiles** Zoe Becerra, Georgia Institute of Technology | Sweta Parmar, Georgia Tech | Keenan May, Georgia Institute of Technology | Rachel Stuck, Georgia Institute of Technology | **Human-Centered Design of GRE Preparation Application for Non-Native English Speakers** Matthew Martell, University of Washington | Yilun Xing, University of Washington | Xiaonan Sun, University of Washington | Ji-Eun Kim, University of Washington | **Novices Perform Like Experts on a Closed Card Sort but Not an Open Card Sort** Ian Robertson, Rice University | Philip Kortum, Rice University | Frederick Oswald, Rice University | Claudia Acemyan, Rice University | **Rider Trust and the Role of the Operator in Automated Shuttles** Amanda Carriero, University of Utah | Kaedyn Crabtree, University of Utah | Joel Cooper, University of Utah | **The Issues for Indexing User Experience** Shinichi Fukuzumi, RIKEN | Yukiko Tanikawa, Corporation incubation division | **VIRTUAL ENVIRONMENTS** **Augmented Reality Applications in Support of Electrical Utility Operations** Angelia Sebok, TiER1 Performance | Rita Mann, TiER1 Performance | Terence Andre, TiER1 Performance | Anders Gronstedt, Gronstedt Group | Kerri Chik, | Ian Cooley, | Dustin Shell, | Heather Anderson, **Evaluation Methodologies For Virtual Reality and Physical Test Environments For Spaceflight Design** Harry Litaker, Leidos/NASA | Rod Archer, Leidos/NASA | Brett Montoya, MEI Technologies | Robert Howard, NASA | **Immersive Learning Environments at Scale: Constraints and Opportunities** Robert Siegle, Arizona State University | Rod Roscoe, Arizone State University | Noah Schroeder, Wright State University | Scotty Craig, Arizona State University | **Virtual Reality: History, Applications, and Challenges for Human Factors Research** Heather Lum, Embry-Riddle Aeronautical University | Lisa Elliott, Penn State University | NA Aqlan, NA | Richard Zhao, Penn State University |

"What the Organization Has": An Investigation of Situational Aspects of Safety Culture of Road Traffic Organization Using a Macroergonomic Approach

Andrijanto, University of Tsukuba, Universitas Kristen Maranatha.
Itoh Makoto, University of Tsukuba.
Pangaribuan Alphared Gabariel, Universitas Kristen Maranatha

This research applied a reciprocal model to investigate the safety culture of road traffic organizations for motorcyclists' safety. By focusing on the situational aspects, we applied the four steps of the macroergonomic approach to analyze a local government organization in Indonesia. We identified some weak elements of safety culture embedded in the sub-system level of the organization. The absence of proper education of motorcyclist candidates has led to failures in developing their skills and knowledge. In addition, we found that the existence of the item "if any" in the licensing registration procedure weakened the understanding of the importance of learning. Investigation of situational aspects revealed some critical issues regarding safety culture development by road traffic organizations.

INTRODUCTION

The concept of traffic safety culture (TSC) has similarities with organizational safety culture (OSC). Therefore methodologies related to OSC can be applied to approach issues regarding TSC (Edwards, Freeman, Soole, & Watson, 2014). Among road traffic organizations (RTO), the government has the highest degree of jurisdiction over road users (Edwards et al., 2014; Wiegmann, von Thaden, & Gibbons, 2007). An investigation of road traffic safety culture is needed to obtain an overview of how the government develops safety culture, how road users apply it to their road traffic activities, and how all related members perceive safety. Based on this, we can design intervention strategies to solve problems from a single perspective.

A framework to investigate the relationships among road user perception, behavior, and safety management corresponds to the reciprocal safety culture (RSC) model developed by Cooper (2000). This framework enables systemic investigation of TSC to give a broad overview of traffic safety problems.

"What the Organization Has"

The RSC model comprises psychological, behavioral, and situational aspects (Cooper, 2016). It means all members of the organizations will contribute to improving safety on a daily basis. "What the organization has" describes the situational aspects of the RSC model (Cooper, 2016). The situational aspect of safety culture represents the organization's policies, procedures, management systems, control systems, communication flows, and workflow systems, and all of these are integrated into organizational mechanisms to manage safety (Cooper, 2019).

The investigation of situational aspects can lead to the identification of safety issues attributed to programs, processes, and practices of improving safety behavior by the organization. It is important to reveal some elements of a weak safety culture within the organization, such as weak leadership, ignoring lessons learned, poor-risk appraisal, risk assessment and risk control, conflict in safety-productivity, a lack of knowledge, skills, and abilities and inadequate quality procedures or an absence of procedures/rules/standards (Cooper, 2019).

Kleiner (1999) utilized a macroergonomic approach to develop the safety culture of an organization in the nuclear power domain. The study revealed deficiencies between organizational expectations and the current situation. Based on the results, the organization designed an intervention to improve safety. As a whole, the study demonstrated the macroergonomic approach in analyzing the safety culture.

The Objective of the Current Study

According to Wandani, Siti, Yamamoto, and Yoshida, (2018), the local government is suitable to manage the safety of motorcyclists. This based on the fact that motorcyclists' trip distance tends to be limited to the urban area.

To improve motorcyclists' safety in Indonesia, we investigated the safety culture of a local government as a case study. First, exploratory research about motorcyclists' safety when riding was conducted in the urban area in 2012 (Andrijanto & Gabariel, 2016). The situation revealed a poor traffic safety culture in the urban area. However, Andrijanto and Gabariel (2016) did not determine the situational aspect of safety culture to investigate RTO. This study analyzes the situational aspect of the local government.

METHOD

Macroergonomic Approach

A macroergonomic approach (Hendrick & Kleiner, 2002) is a systematic methodology for analyzing, designing, and evaluating a work system. The following ten steps are used to solve organizational problems:

1. System and environment scan
2. Production system type and setting performance expectation
3. Unit operations and work process

4. Identifying variances
5. Creating the variance matrix
6. Creating the key variance control table
7. Function allocation and joint design
8. Understanding roles and responsibilities
9. Designing/redesigning support sub-systems and interfaces
10. Implementing, iterating, and improving

The first four steps are an investigation of the work system, steps 5 and 6 are deep investigation, steps 7 and 8 are analysis and comprehension, step 9 is designing/re-designing, and the last step is implementing the design. In this study, we focused on steps 1 to 4.

Step 1 System and Environment Scan.

We interviewed two police officers at the management and operational levels. The objective of the interviews was to compare the organization's expectations with the current conditions.

The interviews focused on the following information about the licensing system: purpose, philosophy, objectives (technical, social, output, and input), boundaries (time), and expectation (customer system, news media system, local community system).

Step 2 Production System Type and Setting Performance Expectations.

In this step, the system function performance in issuing a driving license for prospective motorcyclists follows Sink and Tuttle's model (as cited in Hendrick & Kleiner, 2002), as shown in Figure 1. Questionnaires were used to measure the quality level (Q) of development for each process.

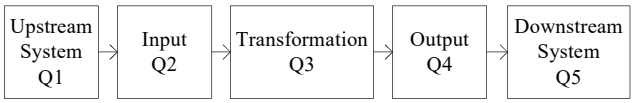

Figure 1 Performance criteria for investigating RTO

Q1 relates to the experience of driving in everyday life before a motorcycle rider applies for a license. Q2 is related to motorcyclists' understanding of traffic regulations. Q3 is related to their understanding of traffic signs, self-safety comprehension, and the safety of others. This process will assess the motorcyclist's understanding of traffic regulations, safety practices, and driving skills. Passing the tests means the driver has the competency to drive safely on the road. Q4 is related to the means of obtaining a driving license. Q5 is related to licensed motorcyclists' response to traffic rules. All contents were discussed by the local government organization, and the questionnaire was approved for research.

In more detail, the questionnaire in Step 2 consisted of six sections. The first section (Q1, Q2, Q4) covered the motorcyclist's background, but not their personal details. Motorcyclists were asked about their driving experience, such as driving knowledge resources (Q1), for example from whom to learn to drive, understanding of traffic regulations (Q2), and the means of obtaining a driving license (Q4). The second section (Q3) comprised 30 questions on basic traffic signs. The third section (Q3) measures the comprehension of self-safety via 11 hazardous situations for a rider. The fourth section (Q3) relates to comprehension of the safety of others via seven hazardous situations that may be dangerous for other road users. The fifth section (Q5) contains five control issues of rule enforcement with punishment. The sixth section (Q5) measured eight issues of rule enforcement with a warning.

Question in sections 2 to 6 were subjectively answered using a 3-point Likert scale. In section 2, participants were asked, "do you understand this sign?" for 30 traffic signs. The participants selected from "understand" (5), "not sure" (3), and "did not understand" (1). In sections 3 and 4, participants were asked, "Is this situation safe?" regarding example traffic situations. The participants responded "yes " (1), "not sure" (3), and "no" (5). Except for passenger must wear a helmet (HPP), apologize after hitting car wing mirror (ACS) and notify something wrong on another vehicle (NWV) responded by selecting "yes " (5), "not sure" (3), and "no" (1). In the last two sections, the question "How often have you performed this action?" for each action. The participants responded "often" (1), "rarely" (3), and "never" (5). Except for using an indicator when turning (TurnL) and using a wing mirror for checking (Smir) responded by selecting "often" (5), "rarely" (3), and "never" (1).

To determine the necessary number of samples for the questionnaire in Step 2, we used the Cochran formula for large populations with a proportion value of 50%, 95% confidence level, and 10% tolerable error. This research required 97 samples. The participants were motorcyclists with a specific local area number plate, randomly selected from a parking lot near the main road. A total of 65 motorcyclists were found to be using manual transmission, and 32 were using an automatic transmission. All participants were at least the legal minimum age to ride a motorcycle.

Step 3 Unit Operations and Work Process.

This step is to draw the current process of input, transformation, and output using a flowchart.

Step 4 Identifying Variances.

By analyzing the previous three steps, we could identify discrepancies between the expectations and the reality at the sub-system level of the organization.

RESULTS

Step 1

In terms of the current condition and expectations, there were no discrepancies between Purpose and philosophy. The organization is fulfilling its function to actualize safety, discipline, and comfort on the road.

The technical objectives were aimed at improving the quality of drivers/motorcyclists through assessments that are representative of actual traffic conditions. A driving simulator

was installed to complement theoretical and practical tests. A safe driving booklet and presentation procedure were developed as a new mechanism to improve safety comprehension.

The social objectives sought to enhance safety comprehension. The RTO's annual program included five riding safety socializations to the road users, 62 traffic safety campaigns, and one visit by police to campus/school. The second aim to produce drivers who understand the rules and can ride safely on the road. Previous research reported 80% of traffic violations involved motorcyclists in the urban areas (Andrijanto & Gabariel, 2016).

The input-objectives are expected to tighten the procedure for applying for a driving license. The actual conditions using procedures derived from previous management. It also expects to provide supervision of the acceptance of prospective drivers. However, such supervision was a little loose.

An online registration process is expected to reduce the time between registration and a prospective driver taking the exam. They expect the registration to be available at any time and any place. In reality, manual registration was implemented at the office during a working day.

Several requests arose from the environment. Customer's expected a clear assessment procedure with feedback at each step. News media requested collaboration to provide information using digital media. The local community asked cooperation in driving safety workshops.

Step 2

Q1 upstream system. Investigation of traffic knowledge resource revealed that 35% learned from their parents, 37% studied various types of media (online resources, magazines, etc.), 5% were taught by police officers, and 23% learned from unknown resources. A total of 46% were taught to ride a motorcycle by friends, 31% by their parents, and 22% by relatives. A total of 33% learned to ride at age >16, 45% at 13–16, 16% at 8–12, and 5% at under 8 years old.

Q2 input. Even for licensed motorcyclists, 57% of the respondents did not know all the regulations, 34% understood a little content, and 9% understood well.

Q3 transformation. Figure 2 shows the answers to the 30 questions. Values from five to one indicate motorcyclists' level of understanding of traffic signs, from understanding to not understanding at all. The results suggest that the motorcyclists understood most of the traffic signs, except #25 and #26.

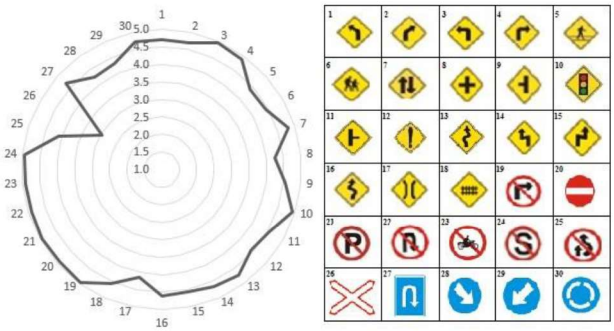

Figure 2 Traffic sign understanding

Figure 3 shows the results of self-safety in 11 hazardous situations. The results reveal that most of the motorcyclists could not comprehend hazardous situations. They tend to take a risk that may endanger themselves. Values from five to one indicate motorcyclists level of understanding the risks that affect their safety, from understanding to not understanding.

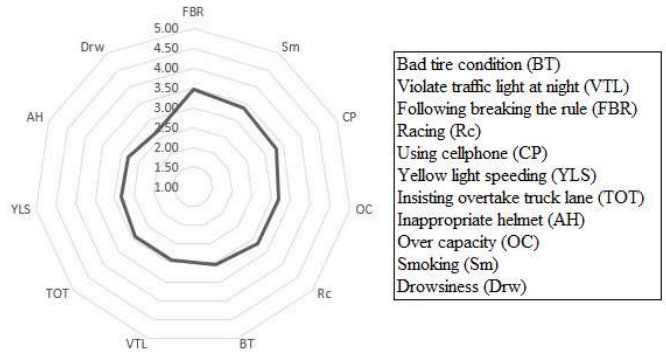

Figure 3 Self-safety comprehension

Figure 4 shows how motorcyclists perceived hazardous situations that may be dangerous to other road users. The results indicated that motorcyclists may still take risks that could endanger other road users. Values from five to one indicate motorcyclists' level of understanding of the risks that affect the safety of other road users, from understanding to not understanding.

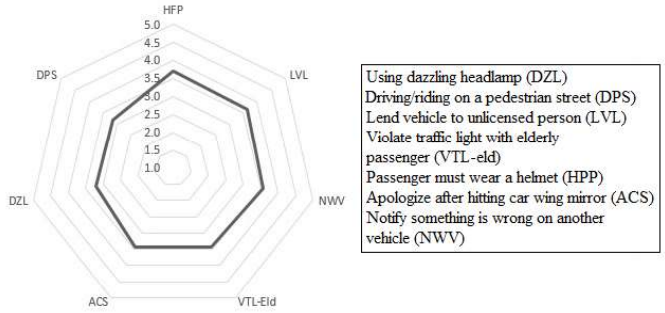

Figure 4 Others-safety comprehension

Q4 output. The investigation found 34% of participants obtained a driving license through the procedural process, 16.5% using the service bureau, and 49.5% using methods that ignored their test result. The results indicated that most of the motorcyclists tried to avoid the procedure or ignore the "failed" result of the three tests via a process that was not procedural. Although they failed the tests, with the help of a third party, the license was still issued. Thus they did not need to retest.

Q5 downstream system. RTO has a responsibility to control driver performance by enforcing traffic rules on the road. There are two kinds of enforcement, the first is using punishment/penalty, and the second is a warning without punishment. Figures 5 and 6 depict motorcyclist performance with punishment enforcement and with warning enforcement, respectively. Values from five to one indicate motorcyclists' level of compliance with traffic rules, from not breaking to breaking the rules. Figure 5 shows that most motorcyclists may break the rules even though there are penalties for violations. Figure 6

shows most of the motorcyclists may break the rule, except for using an indicator for turning and using a wing mirror.

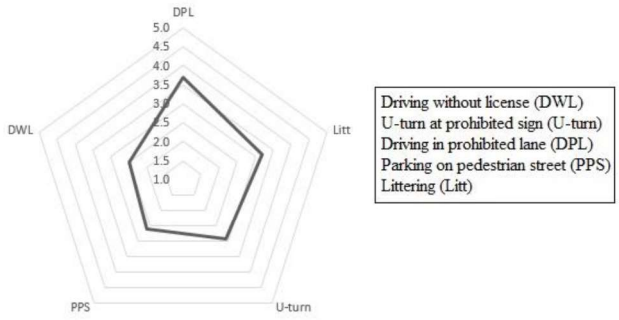

Figure 5 Rule enforcement with punishment

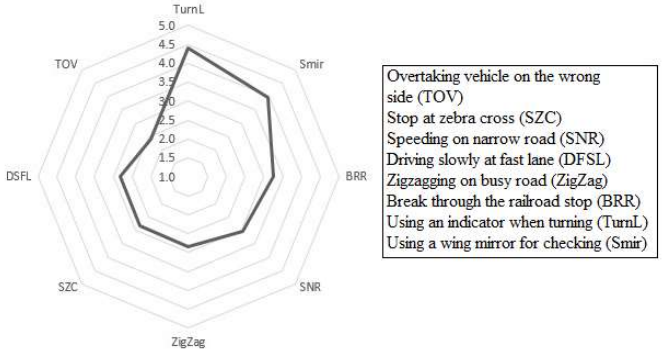

Figure 6 Rule enforcement with warning

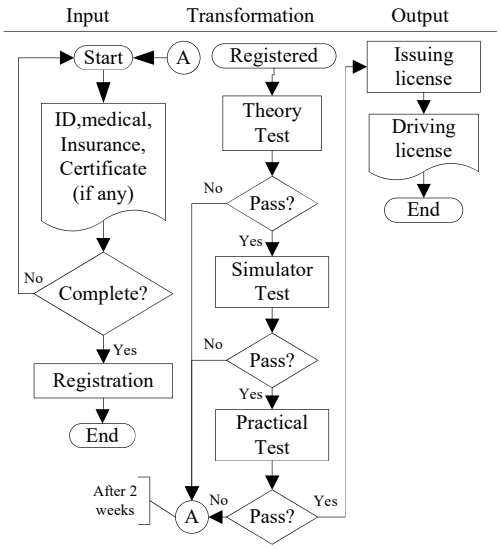

Figure 7 Flowchart of input-transformation-output

Step 3

Figure 7 shows the process flowchart of input, transformation, and output. The flowchart was created by obtaining a description of the system procedures from the police officers, which was confirmed by observing the actual process in the field.

The input consisted of a selection procedure of prospective drivers, who need to register by submitting a copy of their identification card, original certificate of medical checkup, insurance receipt, and certificate of driving lessons (if any).

Candidates are assessed via theory, driving simulator, and practical tests. Theory tests assess the candidate's comprehension of road traffic regulations, such as traffic signs, traffic rules, and safety. Simulator and practical tests assess the candidate's driving skills.

If candidates pass the three tests, their photograph and digital signature are taken, and they receive a license.

Step 4

The RTO expected drivers to be able to understand the traffic regulations through their programs and mechanism (Step 1), but results revealed only 9% understood these (Step 2, input). The status "if any" (Step 3 input process) revealed the absence of a certificate of driving ability in the registration process.

The RTO was assumed to have prepared an assessment that represents actual conditions (Step 1). However, results revealed a lack of proper understanding of safety performance, as shown in Figures 3 and 4. Based on interviews with the motorcyclists, we found they did not understand the assessment procedure very well. Instruction for conducting the test was not properly communicated. Due to a lack of information about the purpose of the test, participants were not able to prepare very well; most passed the theory test but failed in the simulator and practical tests. The simulator is a test that uses a manual transmission only, while 38% of the motorcyclist use an automatic transmission. In addition, they were not familiar with the motorcycle provided by the RTO for the practical test.

The RTO plans to tighten the procedure (Step 1). However, the acceptance procedure for the three tests was loosely controlled (Step 3); candidates may be able to obtain a license without following the correct procedure. A total of 66% of participants were using a third-party service to avoid the tests/retests (Step 2, output). However, the RTO still issued a driving license.

The RTO requires motorcyclists to obey the traffic rules (Step 1), but rule enforcement on the road did not direct driver behaviors effectively. Figures 5 and 6 indicated they may break a rule if there was no direct control on the road (Step 2, downstream). Although the results for using an indicator were good, the police officers doubted the validity of the responses. They claimed motorcyclists may not actually use a correct indicator when turning (using the right indicator for left direction). The results regarding using a wing mirror also positive; however, 21% of participants were found to have modified the wing mirror for aesthetic reasons.

DISCUSSIONS

Based on the results for Step 2, upstream system, most motorcyclists acquired knowledge and skill from society. However, this knowledge did not relate to the traffic regulations they needed to understand as a basic knowledge of driving safely. Only 9% of participants knew the traffic regulations (Step 2, input). It seems the organization's efforts to educate had not been delivered effectively. Lack of knowledge also emerged in their behavior, as shown in Table 1, part A.

They did not understand two important signs, railroad crossing (sign no. 26) and overtaking prohibited (sign no. 25) well.

On the other hand, we believe there is a general lack of knowledge in society. Collaboration with local government was expected to clarify traffic regulation (Step 1) to improve road safety. However, no organization conducted formal education approved by the local government for learning traffic regulations (Step 2, upstream).

The local government has the authority to regulate traffic signs and it is very important drivers recognize these. In addition, they are required to be able to follow the rules contained in such signs. Figure 2 shows most of the participants were able to recognize 30 traffic signs (Step 2, transformation). Although they understood, it did not emerge in their behaviors. Discrepancies between understanding traffic signs and rule-following behavior illustrate a weak comprehension in motorcyclists' performance, as shown in Table 1, part B.

In addition, participants were found to appraise risk incorrectly, as shown in Figures 3 and 4. Although traffic signs are available to warn of hazardous situations, drivers seem to ignore these (Table 1, part C). The results revealed that both conditions (B and C) have a relationship with the examination procedures for obtaining a driving license (Step 2, transformation). The systems were unable to correctly assess driver competency, but they still received a driving license.

The situation above shows that the issuance of a driving license cannot represent the quality of the driver as expected by the RTO in Step 1. First, we found no proper education available in society. The RTO program and mechanism did not effectively educate motorcyclists (Step 4). "If any" status on the driving ability certificate leads candidates to ignore the learning process. Second, the system is unable to assess the driver performance accurately (Step 4). Drivers also engaged in unprocedural processes to obtain a driving license (Step 4). Finally, the rule enforcement on the road could not adequately control driver behavior (Step 4). In this case, the development of a weak safety culture has taken place within RTO.

Table 1 Relationship between traffic sign and driver behavior

	Traffic sign	Behavior	Status
A		Overtaking vehicle/truck Break through the railroad stop	Lack of knowledge
B		Parking on pedestrian street Illegal U-turn Driving in prohibited lane	Weak comprehension
C		Speeding on narrow road Stop at zebra cross Violate traffic light	Poor risk appraisal

CONCLUSIONS

A study on road safety issues needs to consider organizational culture. The government, as a road traffic organization, has a higher degree of responsibility to manage driver safety. It is necessary to identify some weaknesses of the safety culture embedded in an organization before intervening regarding safety management systems. Investigation of situational aspects using macroergonomics revealed organizational issues in developing a safety culture in terms of road traffic. According to a reciprocal model of safety culture, it is also necessary to investigate behavioral and psychological aspects. This study explained "what organization has" in terms of sharing road safety culture, but this remains unclear. It is also important to study the effect of situational aspects on other aspects. To significantly improve road traffic safety, it is necessary to clarify critical issues regarding certain aspects of the perception of road safety.

ACKNOWLEDGMENTS

The authors would like to thank Bandung City Police Precinct and the Industrial Engineering Program Study at the Universitas Kristen Maranatha for their support and cooperation in this research.

REFERENCES

Andrijanto & Pangaribuan, A. G. (2016). Riding a motorcycle: Safety issues in terms of socio-technical and human-machine interaction perspectives (Case study: Road traffic in Bandung). *4th SEANES*, 359-372.

Cooper, M. D. (2000). Towards a model of safety culture. *Safety Science 36,* 111-136

Cooper, M. D. (2016). *Navigating the safety culture construct: a review of the evidence*. Franklin, IN: BSMS. Retrieved from: http://behavioral-safety.com/articles/safety_culture_review.pdf

Cooper, M. D. (2019). The efficacy of industrial safety science constructs for addressing serious injuries & fatalities (SIFs). *Safety Science*, *120* (July), 164–178.

Edwards, J., Freeman, J., Soole, D., & Watson, B. (2014). A framework for conceptualizing traffic safety culture. *Transportation Research Part F: Traffic Psychology and Behaviour*, *26*(PB), 293–302.

Hendrick, H. W., & Kleiner, B. M. (2002). *Macroergonomics Theory, Methods, and Applications*. New Jersey: Lawrence Erlbaum Associates, Inc.

Kleiner, B. M. (1999). Macroergonomic analysis and design for improved safety and quality performance. *International Journal of Occupational Safety and Ergonomics*, *5*(2), 217–245.

Wandani, F. P., Siti, M., Yamamoto, M., & Yoshida, Y. (2018). Spatial econometric analysis of automobile and motorcycle traffic on Indonesian national road and its socio-economic determinants: Is it local or beyond city boundaries? *International Association of Traffic and Safety Science Research 42,* 76-85.

Wiegmann, D. A., von Thaden, T. L., & Gibbons, A. M. (2007). A review of safety culture theory and its potential application to traffic safety. *Improving Traffic Safety Culture in the United States*, (Reason 2000).