

# PERBAIKAN KUALITAS CITRA MENGGUNAKAN METODE *FUZZY TYPE-2*

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## ABSTRAK

Perbaikan kualitas citra dilakukan untuk meningkatkan tampilan atau persepsi dari suatu citra sehingga citra yang dihasilkan dapat digunakan untuk analisis dan juga terlihat lebih baik oleh visual manusia. Berdasarkan domainnya, teknik perbaikan kualitas citra terdiri tiga kategori, yaitu domain spasial, domain frekuensi, dan domain himpunan *fuzzy*.

Perbaikan kualitas citra yang sering dilakukan adalah perbaikan citra dengan kontras yang buruk. Beberapa cara untuk memperbaiki kontras yang buruk dapat dilakukan dengan koreksi *gamma*, *histogram equalization*, metode *fuzzy*, dan lainnya.

Pendekatan dengan metode *fuzzy type-1* memiliki kekurangan, yaitu himpunan *fuzzy* tidak bisa langsung memodelkan suatu ketidakjelasan yang dalam hal ini adalah kontras yang buruk karena fungsi keanggotaannya yang tajam sehingga sulit untuk memodelkan dan meminimalisasi kontras yang buruk. Oleh karena itu, dalam Tugas Akhir ini diimplementasikan fungsi keanggotaan himpunan *fuzzy type-2*, yaitu dengan membuat suatu fungsi keanggotaan *fuzzy type-2* yang dapat memodelkan dan meminimalisasi kontras yang buruk pada citra.

Dengan fungsi keanggotaan *fuzzy type-2*, kontras buruk yang terdapat pada citra berkurang sehingga kualitas citra lebih baik. Hal ini dapat ditunjukkan secara subyektif menggunakan MOS (4,26/Baik) dan secara obyektif menggunakan metrik MSE (2404,06) dan PSNR (17,68 dB).

**Kata Kunci:** perbaikan kualitas citra, kontras, *histogram equalization*, himpunan *fuzzy*, pengolahan citra *fuzzy*, fungsi keanggotaan *fuzzy type-2*, himpunan *fuzzy type-2*

# **IMAGE ENHANCEMENT USING FUZZY TYPE-2 METHOD**

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## **ABSTRACT**

*Image enhancement is carried out to improve the appearance or perception of an image so the result can be used for analysis and also looks better by human visuals. Based on the domain, image enhancement techniques consist of three categories, spatial domain-based, frequency domain-based, fuzzy sets domain-base, etc.*

*Image enhancement that is often used for enhanced image with low contrast. Several ways to enhance poor contrast can be done with gamma correction, histogram equalization, fuzzy methods, etc.*

*The approach with type-1 fuzzy method has a drawback, fuzzy sets cannot directly model such uncertainties in this case is low contrast because of membership function is crisp so it is difficult to model and minimalize low contrast. Therefore, in this final project, the type-2 fuzzy set membership function is implemented, by creating a membership function fuzzy type-2 that can model and minimize low contrast in the image.*

*Through the membership function fuzzy type-2, low contrast of the image is reduced which result better image subjectively using MOS (4,26/Good) and objectively using MSE (2404,.06) and PSNR (17,68 dB).*

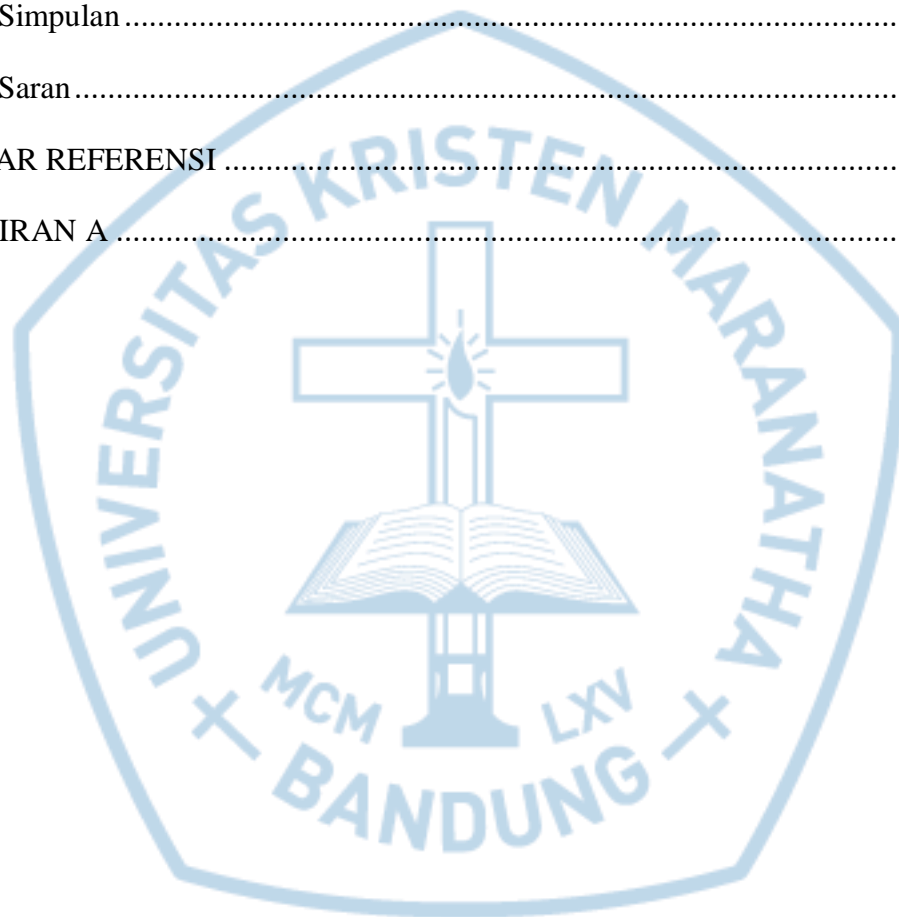
**Keywords:** *image enhancement, contrast, histogram equalization, fuzzy sets, fuzzy image processing, membership function fuzzy type-2, fuzzy type-2 sets*

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