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- c. Vol, No., Bln Thn : Volume 16, Issue 1, February 2021
- d. Penerbit : Taylor's University
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Semarang, 14 Juni 2022

Reviewer 2



Prof. Dr. Ir. Mohammad Bisri, MS
NIP. 19581126 198609 1 001
Unit Kerja : Teknik Pengairan FT
Universitas Brawijaya

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Prof. Dr. Eng. Adi Maulana, S.T., M.Phil
NIP. 19800428 200512 1 001
Unit Kerja : Departemen Teknik Geologi FT
Universitas Hasanuddin

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Makassar, 6 Juni 2022

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 NIP. 19800428 200512 1 001

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Malang, 3 Juni 2022

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Prof. Dr. Ir. Mohammad Bisri, MS.
 NIP. 19581126 198609 1 001
 Unit Kerja : Teknik Pengairan FT
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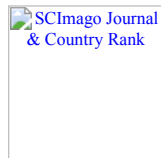
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**ASSESSMENT OF CONTAMINATION VULNERABILITY
OF GROUNDWATER USING SUSCEPTIBILITY INDEX
METHOD: SEMARANG CITY AS CASE STUDY**

THOMAS T. PUTRANTO^{1,*}, ADETYA A. MARJUANTO²

¹Geological Engineering Department, Engineering Faculty, Diponegoro University
Jl. Prof. Soedarto SH, Tembalang, 50275, Semarang, **Indonesia**

²Magister of Environmental Science, School of Graduate Program, Diponegoro University
Jl. Imam Bardjo SH, Pleburan, 50241, Semarang, Indonesia

*Corresponding Author: putranto@ft.undip.ac.id

Abstract

Groundwater is an essential part of natural resources that has unique characteristics compared to other resources due to its renewability and dynamic nature. Semarang City, which is located in Central Java Province Indonesia, is currently facing some environmental problems such as degrading groundwater quality, lowering groundwater level, and flooding. A study is needed to assess the quantity and quality in detail to maintain the existence of groundwater in the long run. One of the efforts to evaluate the potential and quality of groundwater is through studying the groundwater vulnerability to contamination. The objective of this research is to assess the Vulnerability Index of the unconfined aquifer to contamination in the alluvial plain of Semarang City using the Susceptibility Index method. The result conducts three levels of vulnerability: low, moderate, and high. The high level dominantly spreads in the northern, the centre, and the east of the study area. The specific vulnerability map conduct industries and settlements highly contribute to the increasing level of vulnerability. The specific vulnerability map can be represented as a useful tool for the local government to protect and assess groundwater resources.

Keywords: Groundwater, Semarang, Susceptibility Index, Vulnerability.

CONTRAST ENHANCEMENT USING ADAPTIVE THRESHOLD BASED DYNAMIC RANGE ADJUSTMENT IN LUV COLOUR SPACE

PRAVIN M. PARDHI¹, SUDEEP D. THEPADE^{2,*}

¹Department of Technology, Savitribai Phule Pune University, Pune, India

²Computer Engineering, Pimpri Chinchwad College of Engineering, SPPU, Pune, India

*Corresponding Author: sudeepthepade@gmail.com

Abstract

This paper presents a method for contrast enhancement of low light images. The images captured in dark or during night-time cannot be properly perceived by human eye because quality of these images is severally degraded due to lack of clarity. Many image enhancement methods are used widely in image processing to enhance such images. In this proposes an efficient method to enhance the contrast of a low light image by adjusting dynamic range with four steps. Firstly, the low light image is divided into two parts dark part and bright part based on histogram of luminance map of the image. Secondly both the parts are gamma corrected using suitable gamma function. Third, to combine the enhanced regions, fusion method is used and finally to recover the original colour image, colour restoration method is used. In literature the threshold used to divide low light image into two parts is taken as constant (0.5), the proposed method makes this threshold adaptive to the low light image contents by using threshold as exposure, mean of the luminance or median of luminance. Also further the luminance map consideration is proposed to be even proportion of individual colour components rather than weighted proportion. The proposed novel method with image adaptive threshold computation and evenly proportionate luminance components gives better performance as objectively tested with 30 images testbed and NIQE and Entropy as Image Quality Evaluator. Above experiments show that the proposed method gives better results as compared to existing ones. In this method natural scenes like leaves of trees, water bodies can be enhanced to greater extent.

Keywords: Gamma correction, Image Enhancement, Kekre's LUV colour space, Low light image, Luminance.

ECONOMIC OPERATION PLANNING OF COMBINED HEAT AND POWER SMART DISTRIBUTION SYSTEM

MOHAMMED K. AL-SAAD

Department of Electromechanical Engineering,
University of Technology, Al-Karkh, Baghdad, Iraq
E-mail: 50055@uotechnology.edu.iq

Abstract

Optimal planning of the combined heat and power (CHP) smart distribution system increases the energy efficiency of the system effectively and decreases the overall operating and environmental cost. This paper proposes an optimal planning approach to minimize the combined total operating and environmental cost of the distribution grid based CHP. The proposed optimization problem is formulated as an interval mixed-integer quadratic program (IMIQP) in a unit commitment (UC) multi-objective optimization approach. The UC strategy is developed to respond to both the power and heat energy output of the CHP. The emission cost of greenhouse gases is converted to the monetary concept, and emission level limitation constraints are taken into account in the model of the problem. This converts the multi-objective function to a single function that can be solved and the single solution is obtained. Further, a set of comprehensive constraints was taken into consideration when formulating the problem. To verify the applicability of the proposed system, the proposed approach is applied to the low voltage distribution grid. The results reveal that the total cost is minimized. Thus, the proposed multi-objective optimization approach can help to obtain the optimal planning strategy of the CHP grid to minimize the total operating and emission cost.

Keywords: Combined heat and power, Emission cost, Microgrid, Mixed integer quadratic programming, Multi-objective optimization.