



ICAROB 2021

PROCEEDINGS OF THE 2021 INTERNATIONAL CONFERENCE ON ARTIFICIAL LIFE AND ROBOTICS

January 21 to 24, 2021

On line

26th AROB International Meeting Series

Editor-in-Chief

Masanori Sugisaka

Editors: Yingmin Jia, Takao Ito, Ju-Jang Lee

ISBN 978-4-9908350-6-4

OS20-2 *VRMAZU: VR Visualization of Mazu Temple for Passive Interaction with Generated Sound from the ML Technique*(*withdraw*)

Yi-Li Liang, R.P.C. Janaka Rajapakse (Tainan National University of the Arts, Taiwan)
Jen-Tun Lee (Japan Advanced Institute of Science and Technology, Japan)
Yoshimasa Tokuyama (Tokyo Polytechnic University, Japan)

OS20-3 *ThoughtMix: Interactive Water Color Generation and Mixing Based on EEG Data*

R.P.C. Janaka Rajapakse (Tainan National University of the Arts, Taiwan)
Yoshimasa Tokuyama (Tokyo Polytechnic University, Japan)

OS20-4 *HaptWarp: Soft Printable and Motion Sensible Game Controller*

Jen-Tun Lee, Kazunori Miyata
(Japan Advanced Institute of Science and Technology, Japan)
R.P.C. Janaka Rajapakse (Tainan National University of the Arts, Taiwan)

13:00-14:00 OS1 Human-Machine Interface Application (4)

Chair: Norrima Mokhtar (University of Malaya, Malaysia)

Co-Chair: Heshalini Rajagopal (Manipal International University, Malaysia)

OS1-1 *Gray Level Co-Occurrence Matrix (GLCM) and Gabor Features Based No-Reference Image Quality Assessment for Wood Images*

Heshalini Rajagopal¹, Norrima Mokhtar¹, Anis Salwa Mohd Khairuddin¹, Wan Khairunizam²,
Zuwairie Ibrahim³, Asrul Bin Adam³, Wan Amirul Bin Wan Mohd Mahiyidin¹
(¹University of Malaya, Malaysia) (²University of Malaysia Perlis, Malaysia) (³University of Malaysia Pahang, Malaysia)

OS1-2 *Design and Development of Automated Seeding and Irrigation System*

Anirban Kumar, Heshalini Rajagopal (Manipal International University, Malaysia)

OS1-3 *Investigation of A Real-Time Driver Eye-Closeness for the Application of Drowsiness Detection*

Muhammad Zubir bin Kamazlan¹, Wan Khairunizam¹, Abdul Hafiz Halin¹,
M. Rudzuan M. Nor¹, Azian Azamimi Abdullah¹, Norrima Mokhtar²
(¹University Malaysia Perlis, Malaysia) (²University of Malaya, Malaysia)

OS1-4 *Towards Establishing Path Planning Strategies For Autonomous UAVs; A Brief Survey-Summary on Recent Technique*

Anees ul Husnain, Norrima Binti Mokhtar, Noraisyah Binti Mohamed Shah, Mahidzal Bin Dahari
(University of Malaya, Malaysia)

OS abstracts

OS1 Human-Machine Interface Application (4)

Chair: Norrima Mokhtar (University of Malaya, Malaysia)

Co-Chair: Heshalini Rajagopal (Manipal International University, Malaysia)

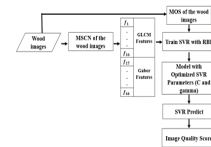
OS1-1 Gray Level Co-Occurrence Matrix (GLCM) and Gabor Features Based No-Reference Image Quality Assessment for Wood Images

Heshalini Rajagopal¹, Norrima Mokhtar¹, Anis Salwa Mohd Khairuddin¹, Wan Khairunizam², Zuwairie Ibrahim³, Asrul Bin Adam³, Wan Amirul Bin Wan Mohd Mahiyidin¹

(¹University of Malaya, Malaysia) (²University of Malaysia Perlis, Malaysia)

(³University of Malaysia Pahang, Malaysia)

Image Quality Assessment (IQA) is an imperative element in improving the effectiveness of an automatic wood recognition system. There is a need to develop a No-Reference-IQA (NR-IQA) system as a distortion free wood images are impossible to be acquired in the dusty environment in timber factories. Therefore, a Gray Level Co-Occurrence Matrix (GLCM) and Gabor features-based NR-IQA, GGNR-IQA algorithm is proposed to evaluate the quality of wood images. The proposed GGNR-IQA algorithm is compared with a well-known NR-IQA, Blind/Referenceless Image Spatial Quality Evaluator (BRISQUE) and Full-Reference-IQA (FR-IQA) algorithms, Structural Similarity Index (SSIM), Multiscale SSIM (MS-SSIM), Feature SIMilarity (FSIM), Information Weighted SSIM (IW-SSIM) and Gradient Magnitude Similarity Deviation (GMSD). Results shows that the GGNR-IQA algorithm outperforms the NR-IQA and FR-IQAs. The GGNR-IQA algorithm is beneficial in wood industry as a distortion free reference image is not required to pre-process wood images.



OS1-2 Design and Development of Automated Seeding and Irrigation System

Anirban Kumar, Heshalini Rajagopal (Manipal International University, Malaysia)

Malaysia, has a very conducive environment for agriculture. Six percent of the population are employed to some of the agriculture activities making agriculture the most curtail industry in Malaysia. Hence, there is a need to develop the agricultural facilities by incorporating latest technological advancements. Conventional seeding process is time consuming and requires additional labor cost. In this project, an automated system is proposed for seeding as well as irrigation process in agriculture which reduces the labor cost. This system aims to increase the efficiency of the seeding process without affecting the nature of soil. The proposed system is equipped with Arduino MEGA and Arduino UNO which acts as the main control unit while ultrasonic and soil moisture sensors are used to detect the obstacles and soil moisture level, respectively. The robot consists of a funnel like arrangement to perform the seeding procedure. The field is equipped with moisture sensors placed at different areas that monitors the moisture level of the soil on a regular interval for irrigation purposes. The proposed system will be of great benefit to the future endeavor of agricultural business as well as it will be able to optimize the seeding and irrigation.

