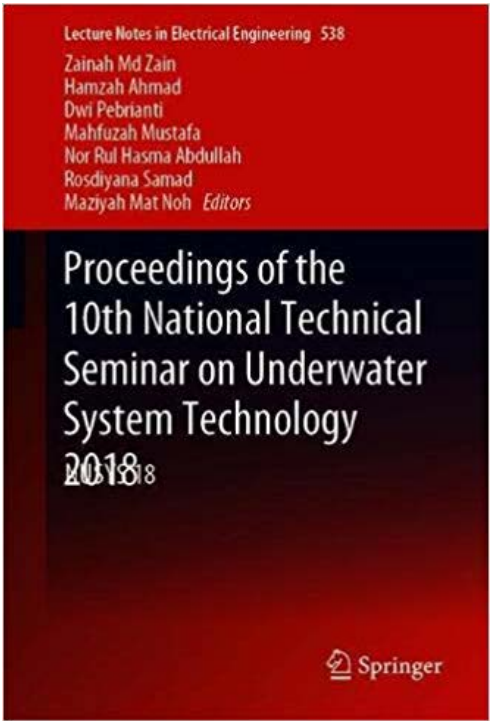

Proceedings of the 10th National Technical Seminar on Underwater System Technology 2018

NUSYS'18

Editors: **Md Zain**, Z., **Ahmad**, H., **Pebrianti**, d., **Mustafa**, M., **Abdullah**, N.R.H., **Samad**, R., **Mat Noh**, M. (Eds.)

ISSN 2194-5357 ISSN 2194-5365 (electronic)
Advances in Intelligent Systems and Computing
ISBN 978-3-030-00978-6 ISBN 978-3-030-00979-3 (eBook)
https://doi.org/10.1007/978-3-030-00979-3

Library of Congress Control Number: 2018955576

This Springer imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Contents

Electromyograph (EMG) Signal Analysis to Predict Muscle Fatigue During Driving 405
Muhammad Amzar Syazani Mohd Azli, Mahfuzah Mustafa, Rafiuddin Abdubrani, Amran Abdul Hadi, Syarifah Nor Aqida Syed Ahmad and Zarith Liyana Zahari

Time-Frequency Analysis from Earthing Application 421
Jun Hou Ting, Mahfuzah Mustafa, Zarith Liyana Zahari, Dwi Pebrianti, Zainah Md Zain, Nurul Hazlina Noordin and Rafiuddin Abdubrani

Energy Spectral Density Analysis of Muscle Fatigue 437
Noor Aisyah Ab Rahman, Mahfuzah Mustafa, Rosdiyana Samad, Nor Rul Hasma Abdullah and Norizam Sulaiman

Modelling Automatic IoT Home Light System (SmartLi) by NODEMCU ESP8266 447
Muhammad Muttaqin A. Rahim, Nor Shazwanie Ramli, Najwa Raihana Abdul Wahab and Rohana Abdul Karim

Development of Automated Gate Using Automatic License Plate Recognition System 459
Luai Taha Ahmed Al-Mahbashi, Nurhafizah Abu Talip Yusof, Syamimi Shaharum, Mohamad Shaiful Abdul Karim and Ahmad Afif Mohd Faudzi

Design of T-Shaped UWB Antenna with Dual Band Rejection Using Inverted U- and C-Shaped Slots 467
Salwa Awang Akbar, Ahmad Syahiman Mohd Shah, Ahmad Afif Mohd Faudzi, Sabira Khatun, Syamimi Mardiah Shaharum, Nurhafizah Abu Talip @ Yusof and Mohamad Shaiful Abdul Karim

Inter Vehicle Communication System for Collision Avoidance 475
Nurul H. Noordin, Althea C. Y. Hui, Nurulfadzilah Hassan and Rosdiyana Samad

Time-Frequency Analysis from Earthing Application

Jun Hou Ting, Mahfuzah Mustafa, Zarith Liyana Zahari, Dwi Pebrianti, Zainah Md Zain, Nurul Hazlina Noordin and Rafiuddin Abdubrani

Abstract Body earthing or grounding means that connecting the body in direct and uninterrupted contact with the earth by touching the soil, sand, water, or a conductive surface that is in contact with the earth. By earthing the body, positive charge can be neutralized and return the body to a neutral state as the positive charge that builds up can lead to health problems. There are few types of time-frequency analysis method such as Gabor, Wavelet and Wigner. The experiment of body earthing is done by recording the EEG signal from human brainwave with the Emotive EPOC Headset. To remove the noise of the signals, in pre-processing stage is important to separate the signal into two band frequency band which are alpha band and beta band with the threshold of signal amplitude was set to −100 to 100 μV. Then the peak points were plotted into a histogram to compare the changes of the Alpha and Beta band signals. Lastly, the results of before body earthed and after body earthed were compared through the histogram plotted. The result shows that, before the body earthed, the Alpha band signals are low, while the Beta band signals are high. Then after body earthed, the Alpha band increased, while the Beta band are decreased. From the result show that the body earthing reduced the stress of the student.

Keywords EEG signal · Time frequency · Gabor transform · Wavelet transform Wigner transform

J. H. Ting · M. Mustafa (✉) · Z. L. Zahari · D. Pebrianti · Z. Md Zain · N. H. Noordin R. Abdubrani
Universiti Malaysia Pahang, Pekan, Pahang, Malaysia
e-mail: mahfuzah@ump.edu.my

Z. L. Zahari
Universiti Kuala Lumpur British Malaysian Institute, Gombak, Selangor, Malaysia

Z. Md Zain et al. (eds.), *Proceedings of the 10th National Technical Seminar on Underwater System Technology 2018*, Lecture Notes in Electrical Engineering 538,
https://doi.org/10.1007/978-981-13-3708-6_36