



# NORTH ATLANTIC UNIVERSITY UNION

Editor

Charalampos Arapatsakos

## Recent Advances in Mechanics and Mechanical Engineering

- *Proceedings of the 6<sup>th</sup> International Conference on Fluid Mechanics and Heat & Mass Transfer (FLUIDSHEAT '15)*
- *Proceedings of the 1<sup>st</sup> International Conference on Mechanical and Transportation Engineering (ICMTE '15)*

*Kuala Lumpur, Malaysia, April 23-25, 2015*

### Scientific Sponsors



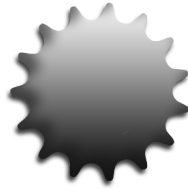
University Kebangsaan  
Malaysia



Universiti Teknologi  
Malaysia



University of Naples  
Federico II, Italy



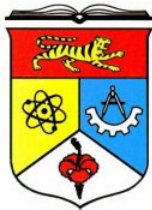
# **RECENT ADVANCES in MECHANICS and MECHANICAL ENGINEERING**

**Proceedings of the 6th International Conference on Fluid Mechanics and Heat  
& Mass Transfer (FLUIDSHEAT '15)**

**Proceedings of the 1st International Conference on Mechanical and  
Transportation Engineering (ICMTE '15)**

**Kuala Lumpur, Malaysia  
April 23-25, 2015**

## **Scientific Sponsors**



University Kebangsaan  
Malaysia



Universiti Teknologi  
Malaysia



University of Naples Federico II  
Italy

# **RECENT ADVANCES in MECHANICS and MECHANICAL ENGINEERING**

**Proceedings of the 6th International Conference on Fluid Mechanics and Heat  
& Mass Transfer (FLUIDSHEAT '15)**

**Proceedings of the 1st International Conference on Mechanical and  
Transportation Engineering (ICMTE '15)**

**Kuala Lumpur, Malaysia  
April 23-25, 2015**

Published by WSEAS Press  
[www.wseas.org](http://www.wseas.org)

**Copyright © 2015, by WSEAS Press**

All the copyright of the present book belongs to the World Scientific and Engineering Academy and Society Press. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the Editor of World Scientific and Engineering Academy and Society Press.

All papers of the present volume were peer reviewed by no less than two independent reviewers. Acceptance was granted when both reviewers' recommendations were positive.

ISSN: 2227-4596  
ISBN: 978-1-61804-298-9

# **RECENT ADVANCES in MECHANICS and MECHANICAL ENGINEERING**

**Proceedings of the 6th International Conference on Fluid Mechanics and Heat  
& Mass Transfer (FLUIDSHEAT '15)**

**Proceedings of the 1st International Conference on Mechanical and  
Transportation Engineering (ICMTE '15))**

**Kuala Lumpur, Malaysia  
April 23-25, 2015**



**Editor:**

Prof. Charalampos Arapatsakos, Democritus University of Thrace, Greece

**Committee Members-Reviewers:**

Mohammad Nazri Mohd Jaafar  
Mazlan Abdul Wahid  
Muhammad Musaddique Ali Rafique  
Vasile Cojocaru  
Konstantin Volkov  
Isaac Yeboah  
Oguz Arslan  
Damelys Zabala  
Heimo Walter  
Valeriy Perminov  
George D. Verros  
Alina Adriana Minea  
M. M. Noor  
Elena Scutelnicu  
Krisztina Uzunianu  
Dan Victor Cavaropol  
Calbureanu Popescu Madalina Xenia  
Guoxiang Liu  
Najib Altawell  
Petr Mastny  
Cristian Patrascioiu  
Hamed Ziaepoor  
Mihaela Dudita  
Mokhtari Fouad  
Frederic Kuznik  
Noordin Mohd Yusof  
Musa Mailah  
Mohamed Hussein  
Pakharuddin Mohd Samin  
Izman Sudin  
Claudio Guarnaccia  
Nabil Mohareb  
Nikolaos Eliou  
Valentina E. Balas  
Catalin Popescu  
Ioannis Politis  
Stratis Kanarachos  
Asuman Ozger  
Athanasios Galanis  
Jorge Alberto Ruiz-Vanoye  
Zdenek Riha  
Ioan Sorin Herban  
Grigorios Papageorgiou



## Table of Contents

<a href="#"><u>An Exploratory Discussion of the Impacts of Driverless Vehicle Operations on the Man-Made Environment</u></a>	9
<i>Samuel Labi, Tariq Usman Saeed, Matthew Volovski, Saeed Dhafer Alqadhi</i>	
<a href="#"><u>Effects of Gas Turbine Inlet Temperature on Exergy Efficiency, Cost and Environment of a Combined Cycle Power Plant</u></a>	16
<i>Abdolsaeid Ganjeh Kaviri, Mohammad Nazri Mohd Jaafar</i>	
<a href="#"><u>Tug Boat Monitoring Fuel Oil Consumption by Using Flow Meter</u></a>	23
<i>Danny Faturachman, Shahrin Febrian, T. D. Novita, Achmad Djaeni</i>	
<a href="#"><u>Elemental Composition Study of Commercial Brake Pads for a Passenger Vehicle: A Case Study</u></a>	29
<i>Afiqah O., Fauziana L., Rasid O., Wong S. V.</i>	
<a href="#"><u>Influence of Exhaust Design on the Characteristics of Vortex Combustion</u></a>	35
<i>Mostafa Khaleghi, S. E. Hosseini, M. A. Wahid, H. A. Mohammed</i>	
<a href="#"><u>Study on the Thermal Flow Analysis of Cryogenic Chamber for Cold Climate Test of Large Wind Turbine Parts</u></a>	45
<i>Yulho Kang, Min-Kyu Kim, Warn-Gyu Park</i>	
<a href="#"><u>Study on the Characteristics of Hydrogen-Enriched Biogas Co-Flow Flameless Combustion</u></a>	52
<i>Seyed Ehsan Hosseini, G. Bagheri, M. Khaleghi, Mazlan Abdul Wahid</i>	
<a href="#"><u>The Effect of Swirling Vortex Combustion on NOX Emissions</u></a>	62
<i>Raid A. Alwan, M. A. Wahid, Mohd Fairus M. F, A. A. A. Abuelnuor, Arkan Al Taie</i>	
<a href="#"><u>CFD Simulation Study of Natural Gas Pipe Failure</u></a>	67
<i>Z. A. Majid, R. Mohsin, M. Z. Yusof</i>	
<a href="#"><u>Large Eddy Simulation of the Wind Flow Over Skyscrapers</u></a>	72
<i>Z. Harun, E. Reda, S. Abdullah</i>	
<a href="#"><u>Numerical Analysis of Multiphase Cavitating Flow</u></a>	80
<i>Warn-Gyu Park, Dong-Hyun Kim, Chul-Min Jung</i>	
<a href="#"><u>Cascading Proportional Derivative and Active Force Control of a Mobile Manipulator</u></a>	86
<i>Shariman Abdullah, Musa Mailah, Collin Tanghowe Hing</i>	
<a href="#"><u>Deviation of After-Market Brake Discs with UN R90 Standard</u></a>	92
<i>Fauziana L., Afiqah O., Rasid O., Wong S. V.</i>	
<a href="#"><u>Requirement of Seat Belt Reminder for Rear Seats in M1 Vehicles</u></a>	96
<i>Fauziana L., Afiqah O., Rasid O., Wong S. V.</i>	



<b><u>Intelligent Control and Instrumentation for Hollow Fiber Membrane Manufacturing System</u></b>	100
<i>Shahab Khademi, Intan Zaurah Mat Darus, M. Rezaei Dashtarzhandi, Musa Mailah, M. Abbasgholipourghadim, A. F. Ismail, Lau Woei Jye</i>	
<b><u>Dielectrophoretic Characterization of Colloidal Particles Using Angled Microelectrode Arrays</u></b>	106
<i>Nurul Amziah Md Yunus, Izhal Abdul Halin, Nicolas G. Green</i>	
<b><u>Porosity Prediction of Hollow Fiber Membrane Incorporating Neural Network and Digital Image Processing</u></b>	113
<i>Mohammad Abbasgholipourghadim, Musa Mailah, Intan Zaurah Mat Darus, A. F. Ismail, M. Rezaei Dashtarzhandi, Mehdi Abbasgholipourghadim, Shahab Khademi</i>	
<b><u>Porosity and Pore Area Determination of Hollow Fiber Membrane Incorporating Digital Image Processing</u></b>	118
<i>Mohammad Abbasgholipourghadim, Musa Mailah, Intan Zaurah Mat Darus, A. F. Ismail, M. Rezaei Dashtarzhandi, Mehdi Abbasgholipourghadim, Shahab Khademi</i>	
<b><u>Charateristics of Taxi Operation at Bandar Tasik Selatan Rail Station</u></b>	124
<i>Sulistyo Arintono</i>	
<b><u>Harvesting Energy from the Vibration of Suspension of a Passenger Vehicle</u></b>	128
<i>Mohd Azman Abdullah, Jazli Firdaus Jamil</i>	
<b><u>Numerical Investigation of the Air-Side Performance in the Corrugated Fin-and-Oval Tube Compact Heat Exchangers</u></b>	134
<i>Ahmadali Gholami, Mazlan Abdul Wahid, Hussein A. Mohammed</i>	
<b><u>Casson Fluid Flow from a Horizontal Circular Cylinder with Multiple Slips Condition in Non-Darcy Porous Medium with Thermal Radiation</u></b>	141
<i>Stanford Shateyi, Fazle Mabood</i>	
<b><u>Mathematical Modeling of Bubbler Humidifier for Humidification-Dehumidification (HDH) Water Desalination System</u></b>	147
<i>Hafiz M. Abd-ur-Rehman, Fahad A. Al-Sulaiman</i>	
<b><u>About Calculation of a Heterogeneity Force of Resistance of the Long String in Viscous Media at Laminar Flow Near its Surface</u></b>	157
<i>S. O. Gladkov</i>	
<b><u>Authors Index</u></b>	161