

# **2014 15th International Workshop on Research and Education in Mechatronics**

**(REM 2014)**

**El Gouna, Red Sea, Egypt  
9-11 September 2014**



**IEEE Catalog Number: CFP1445X-POD  
ISBN: 978-1-4799-3030-2**

## Education and Learning Track

1. Student Retention in a Mechatronics Programme in First and Second Years: Motivating Engineers to Learn through Music and Creativity 6  
*Dale A Carnegie, Ajay Kapur, Gideon Gouws, Craig Watterson*
2. Using Elevator System Modelling and Simulation for Integrated Learning in Mechatronics Engineering 23  
*Lutfi Al-Sharif, Tarek A. Tutunji, Dana Ragab, Range Kayfi*
3. Mobile Walking Robot "GREG". PBL project designed in Accordance with BEAM Philosophy 82  
*Grzegorz Klapyta*
4. Disseminating mechatronics research results ( via science and engineering exhibitions) 97  
*Tariq Sattar, Ener Salinas*
5. How to convert a factory-manufactured induction motor into rotary-linear motor ? Part 1 Constructional issues 120  
*Krzysztof Kluszczynski, Marcin Szczygiel*
6. How to convert a factory-manufactured induction motor into rotary-linear motor ? Part 2 Design issues from viewpoint of educational purposes and industrial demands 126  
*Krzysztof Kluszczynski, Marcin Szczygiel*
7. The development of a lifelong learning framework for mechatronics engineering 150  
*Zlatov Nikolay, Tariq Sattar*
8. Development of a Jordanian-European Double Degree Master Program in Mechatronics Engineering 157  
*Nathir Rawashdeh, Tarek A. Tutunji, Mohammed Bani Younis*
9. OpenWRT operating system based controllers for mobile robot and building automation system students projects realization 174  
*Marek Kciuk*
10. The inverse rule for designing reluctance motor - its educational and industrial advantages 178  
*Damian Krawczyk, Krzysztof Kluszczynski*
11. Bachelor and Master Theses in Mechatronics Engineering Study Courses - Experiences and Perspectives 183  
*Reiner Dudziak, Dirk Mohr*

## Industrial Applications Track

1. Control and Modeling a Robot Arm via EMG and Flex signals 31  
*Ehab Faidallah, Saber Abdrabbo, Yehia Hossamel-din, Yehia El-Mashad*

2. Implementation of Power Semiconductor Aging Behavior in an Electric Vehicle  
Powertrain Model 76  
*Markus Oettl, Reinhard Schneider, Thomas Schmitt*
3. A Novel Approach of Health Monitoring and Anomaly Detection Applied to Spacecraft  
Telemetry Based on PLSDA Multivariate Latent Technique 144  
*Bassem Nassar, Wessam Hussein*
4. Development of Integrated Brakes and Engine Traction Control System 163  
*Magdy Abdelhameed, Mohamed Abdelaziz, Nancy El-Hady, Ahmed Hussein*
5. Speed Control of BLDC Motor By Using PID Control and Self-tuning Fuzzy PID Controller 197  
*Mohamed Shams Eldin, Adel A. EL-Samahy EL-Samahy*
6. Mechatronics system for tire pressure control 206  
*Adel Hendy, Shawky Hegazy, Mohamed Emam, Yehia Hossamel-din*
7. A Comparative Investigation of A Rule Based Energy Management Algorithm for Hybrid  
Electric Vehicles 211  
*Al-Hosseini Mostafa Sharaf, Shawky Hegazy, Ahmed Ali, Hesham Eltaher Kamel*
8. Estimation of the Photovoltaic modules energy production in respect of the PV  
inclination angle 218  
*Zlatov Nikolay, Iliya Krastev Iliev, II, Angel Terziev, Veselka Kamburova*
9. Influence of climatic data and degradation factor on the efficiency of the Photovoltaic  
modules 223  
*Zlatov Nikolay, Iliya Krastev Iliev, II, Angel Terziev, Veselka Kamburova*

### **Mechatronics systems Track**

1. Effect of Nano Carbon tubes - Nano Aluminum oxide particles on electrical conductivity  
of Copper matrix and Nano Aluminum oxide Nano carbon tubes composites 1  
*Manal Ramadan*
2. Wind resource assessment and numerical simulation for wind turbine airfoils 14  
*David Wekesa, Cong Wang, Yinjie Wei, Joseph Kamau*
3. Use of Finite Element Method for the Numerical Analysis of Eddy Current Brake 39  
*Mohamed Talaat, Nabil Hassen*
4. How accurate can a stereovision measurement be? 54  
*Kristiaan Schreve*
5. Modeling And Simulation of A New Bioinspired Muscle Actuator 61  
*Sabreen Abdelwahab, Mohammed Awad, Farid Tolbah, Magdy Abdelhameed*
6. Numerical Prototyping of Low Cost Vibration Sensor Systems using Data Acquisition  
Software 68

*Josef Vollmer, Martin Ulrich, Christoph Mauel*

7. The idea of laboratory stand for rapid prototyping of robot control systems for remote operation via Internet 87  
*Paweł Kielan, Grzegorz Kłapyta*
8. Modeling and verification of spring loaded robotic finger mechanism 91  
*Mina Raafat Ramzy, Salem Haggag, Yehia Hossamel-din*
9. Force-torque sensor integration in industrial robot control 132  
*Jonas Loske, Rolf Biesenbach*
10. Design issues of electromagnetic micropump 137  
*Sebastian Bartel, Tomasz Trawiński*
11. Hybrid PSO-HIL Approach for Controller Tuning in Servo Pneumatic Systems 168  
*Ashraf Saleem, Bashar Taha*
12. Multi-Robot System for Real-Time Sensing and Monitoring 191  
*Ahmad M. Derbas, Kasim M. Al-Aubidy, Mohammed M. Ali, Abdallah W. Al-Mutairi*

#### **Methodologies, Tools and languages Track**

1. Network Models of Electromagnetic Actuators 46  
*Andrzej Demenko*
2. A Modular Architecture of a PC-based Driving Simulator for Advanced Driver Assistance Systems Development 104  
*Kareem Abdelgawad, Mohamed Abdelkarim, Bassem Hassan, Michael Grafe, Iris Gräßler*
3. Methodology for the identification of solution patterns within mechatronic systems 112  
*Martin Rabe, Harald Anacker, Roman Dumitrescu*