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RESEARCH SUMMARY

My research interest is in the area of Mechatronic systems design, Robotics (Industrial, Rehabilitation, Mobile, Walking, and Humanoid Robotics), Control systems design, Intelligent control, Automation, IoT based automation, Manufacturing informatics, Digital manufacturing, smart composite structures, autonomous and smart systems, Pneumatic and Hydraulic systems, and Biomechatronics. I worked also in an interdisciplinary research project that requires integration of biological sciences, biomechanics, rehabilitation engineering, human in the loop testing, clinical testing, mechanical engineering, electronics, machine learning, control and mechatronics. This research project activities focused on developing smart assistive and rehabilitation robotic solution to enhance human life. My current research activities focus on applying mechatronic system design approaches in the areas of industrial, healthcare, manufacturing, agriculture and energy.

RESEARCH AND ACADEMIC SKILLS

- Using mechatronic system design methodology to solve multi-/interdisciplinary domain problems starting from identifying system requirements going through modelling and simulation process and then implementation, testing and evaluation of the physical prototypes.
- Using Solidworks and AutoCAD to design and develop virtual prototyping, technical drawings and assemblies for mechanical devices, robotics and mechatronic systems.
- Develop numerical and analytical mathematical models for multiphysics systems using MATLAB, MSC ADAMS and MAPLE.
- Using MATLAB and LabVIEW to program and control mechatronic systems.
- Using classic PID feedback control, cascading control loops, and advanced control techniques.
- Using impedance and admittance control for control and regulate human-robot interaction.
- Design and implement pneumatics and hydraulics to control mechanical and mechatronic systems
- Using machine learning and artificial intelligence techniques to predict, estimate and tune system parameters, behaviors and patterns.
- Using solid mechanics techniques to analyze mechanical systems and study the biomechanics of human.
- Using design, manufacturing, electronics and control knowledge to implement mechatronic systems.
- Using human biological signals such as EMG and EEG to control robotics and devices.

EMPLOYMENT

09/2018-PRESENT **COORDINATOR OF MECHATRONICS ENGINEERING PROGRAM, FACULTY OF ENGINEERING, AIN SHAMS UNIVERSITY, CAIRO, EGYPT**

10/2018-PRESENT **ASSOCIATE PROFESSOR, MECHATRONICS ENGINEERING DEPARTMENT, FACULTY OF ENGINEERING, AIN SHAMS UNIVERSITY, CAIRO, EGYPT**

01/2017-09/2018 **ASSISTANT PROFESSOR, DESIGN AND PRODUCTION ENGINEERING DEPARTMENT, MECHANICAL ENGINEERING, FACULTY OF ENGINEERING, AIN SHAMS UNIVERSITY, CAIRO, EGYPT**

I was teaching undergraduate and postgraduate courses in the area of mechatronics and automatic control. Also, I prepare and design lab experiments for control and mechatronics courses. Also, I supervise postgraduate students and graduation projects.

09/2013-12/2016 **RESEARCH FELLOW, INSTITUTE OF DESIGN, ROBOTICS AND OPTIMISATION (IDRO), MECHANICAL ENGINEERING, UNIVERSITY OF LEEDS, LEEDS, UK**

I was involved in collecting kinematics and kinetics data from both able-bodied and amputee participants using gait analysis motion capture system, Inertia measurement units (IMUs) and footswitches during activities of daily living in order to find the key objective measures for the prosthetic's performance. In addition to evaluating and identifying biomechanical parameters involved in prosthetic knee design, adaptability and gait asymmetry of transfemoral amputees. Also, designing,

developing and fabrication of an instrumented prosthetic leg including developing control algorithms and testing on a transfemoral amputee in real environments.

01/2013-08/2013 ASSISTANT PROFESSOR, DESIGN AND PRODUCTION ENGINEERING DEPARTMENT, MECHANICAL ENGINEERING, FACULTY OF ENGINEERING, AIN SHAMS UNIVERSITY, CAIRO, EGYPT

I taught four courses (two undergraduate and two postgraduate). I was also involved in the department administrative work and participated with other academic staff to develop new mechatronics curriculum based on credit hours system for undergraduate students to cover the state-of-the-art technologies in mechatronic fields by developing modules to serve Industrial automation, Autotronics, Nanomechatronics, and Biomechatronics.

07/2007-01/2008 PART-TIME RESEARCH ASSISTANT IN PROJECT TITLED "DIAGNOSIS AND MAINTENANCE OF RELAY LADDER LOGIC PROGRAMS AND PLC LADDER DIAGRAMS USING ARTIFICIAL NEURAL NETWORKS" AT AIN SHAMS UNIVERSITY.

I worked as a part-time research assistant in joint funded research from US-Egypt Science and Technology (INF9-001-007). This research aimed to use develop a compact manufacturing system as an experimental setup for discrete event control in order to model and control a manufacturing process using petri-net and neural network in addition to using neural network for fault diagnosis during the manufacturing process due to faults in sensors status.

01/2003-07/2003 PART-TIME MECHANICAL ENGINEER IN "DESIGN, CONSTRUCTION AND MAINTENANCE OF METAL PRODUCTION LINES, ROSHDY METAL INDUSTRY CORP. (RMI)", EGYPT.

I worked as part-time mechanical engineering in RMI in a project for design and manufacture a hydraulic tunnel boring machine.

02/2002-08/2008 TEACHING ASSISTANT, DESIGN AND PRODUCTION ENGINEERING DEPARTMENT, FACULTY OF ENGINEERING, AIN SHAMS UNIVERSITY, CAIRO, EGYPT

I was involved in problem-solving, lab demonstration, undergraduate projects co-supervision, and teaching undergraduate students.

EDUCATION

2012 PhD in Mechanical Engineering

University of Leeds, Leeds, UK.

Thesis Title: A Novel Biomechatronic Above Knee Prosthetic Device Based on Dynamic Coupling Effect

2006 Pre-PhD postgraduate courses in Mechatronics Engineering

Ain Shams University (ASU), Cairo, Egypt.

Courses: Intelligent Control, Systems Dynamics, and Digital Control.

2005 M.Sc in Mechanical Engineering

Ain Shams University (ASU), Cairo, Egypt.

Thesis Title: Design and Implementation of a Parallel Robot-Based Machining Centre

Courses: Advanced Engineering Mathematics, Engineering Numerical Analysis, Design of Experiments, Automatic control, Mechatronics, and Pneumatics and Hydraulic Control.

2001 BSc in Design and Production Engineering

Ain Shams University (ASU), Cairo, Egypt.

Courses: More than 50 courses related to the following topics: Basic Science and Engineering, Applied Mechanics, System Design, Manufacturing Technology, Material Science, and Industrial Engineering.

INTERDISCIPLINARY EXPERIENCE

- EPSRC (EP/K020463/1) "A Biomimetic, Self-Tuning, Fully Adaptable Smart Lower Limb Prosthetics with Energy Recovery": This project is interdisciplinary and involving people from different disciplines including

industrial partner (Blatchford & Sons Ltd), Seacroft hospital (prosthetic and orthotics centre) and faculty of biological sciences, Institute of Medical and Biological Engineering and Institute of Design, Robotics and Optimisation (iDRO) at University of Leeds.

- I worked at RMI, Egypt with a multi-/interdisciplinary team of mechanical, electrical, mechatronics and civil engineers to design and manufacture hydraulic tunnel boring machines.
- I was involved in El Chourbagui Textiles for textile and scarf manufacturing in assembly and testing of automatic flat fabric printing line.
- Mechatronic system design experience: mechatronics is defined as a multi-/interdisciplinary field that combine different fields together to develop efficient products.

PUBLICATION SUMMARY

h-index: 9, i10-index: 9, Citation: 254. (Google Scholar – October 2020)

h-index: 7, Citations: 156, (Scopus; October 2020)

2 Book chapters, 13 journal papers, More than 34 peer reviewed full international conference papers and More than 10 one page conference paper. (For details see Appendix I)

STUDENTS CO-SUPERVISION

1. Part-time MSc, Ain Shams University, Egypt (2020- present)
   Thesis title: Optimization of EMG signals Classification Technique for hand gesture recognition
2. Part-time MSc, Ain Shams University, Egypt (2019- present)
   Thesis title: Develop Control Architectures to Enable Hand Rehabilitation Therapy Modes in Soft Gloves
3. Part-time MSc, Ain Shams University, Egypt (2019- present)
   Thesis title: Improve the performance of autonomous robots using machine learning
4. Part-time MSc, Ain Shams University, Egypt (2019- present)
   Thesis title: Dynamic walking control of humanoid lower limb
5. Part-time MSc, Ain Shams University, Egypt (2019- present)
   Thesis title: Estimating the Remaining Useful Life of Industrial Machinery using machine learning
6. Part-time MSc, Ain Shams University, Egypt (2018- present)
   Thesis title: Shape Control of Large Deformation Continuum Robot
7. Part-time MSc, Ain Shams University, Egypt (2018- present)
   Thesis title: Characterization of fiber reinforced composite laminates embedded with sensors
8. Part-time MSc, Ain Shams University, Egypt (2015- 2018)
   Thesis title: Design and Control of a Multi-grasping Bionic Transradial Prosthesis
9. Part-time MSc, Ain Shams University, Egypt (2015- 2018)
   Thesis title: Development of a Real Time Pattern Recognition Myoelectric Control Scheme for a Hand Prosthesis
10. PhD, Universiti Tun Hussein Onn Malaysia - UTHM (2014-2018)
    Thesis title: Artificial Visual Perception Using Hierarchical Model for Road Recognition
11. Part-time MSc, Ain Shams University, Egypt (2015- 2018)
    Thesis title: Hand Prosthetic Controlled System Based on Signal Pattern Recognition of Electroencephalography
12. PhD, University of Leeds, UK (2014-2018)
    Thesis title: Haptic Feedback for Lower Limb Prostheses
13. PhD, University of Leeds, UK (2014-2017)
    Thesis title: Real-Time Estimation of Temporal Gait Parameters in Lower Limb Amputees using Inertial Sensors
14. MSc, University of Leeds, UK (2014-2015)
    Thesis title: Design and Development of an Intelligent Control for a Prosthetic Knee
15. Part-time MSc, Ain Shams University, Egypt (2013-2015)
    Thesis title: Identification of Human Gait Activities using IMUs
16. Supervise undergraduate projects at Ain Shams University (2017-present)
17. Assist and supervise more than 20 undergraduate projects at Ain Shams University (2004-2008, 2012-2013, and 2017-present) and University of Leeds (2008-2012 and 2014-2016)

ACADEMIC AND TEACHING EXPERIENCE

I was involved in teaching undergraduate and postgraduate students at Ain Shams University (ASU), University of Leeds (UoL), and New Cairo Technological University (NCT). I taught:

- Postgraduate: Mechatronics system design (ASU), Selected topics in Mechatronics (ASU), Supervisory Control of Discrete Event Systems (ASU), Modern Control (ASU), Optimal Control (ASU), and Biomechatronics and Medical Robotics (UoL)
- Undergraduate: Dynamic Modeling and Simulation (ASU), Industrial Robotics (ASU), Rehabilitation Robotics (ASU), Biomedical Engineering (ASU), Design of Mechatronic Systems (ASU), Hybrid Control Systems (ASU), Automatic Control (ASU), Measurement systems design and applications (ASU), Hydraulics and pneumatics control (ASU), System dynamic modelling and simulation (ASU), Computer Numerical Control (CNC) (ASU), Logic control systems (ASU), Mechanical vibration (ASU), Theory of machines (ASU), Machine design and construction (ASU), Machine elements design (ASU), Stress analysis (ASU), and Manufacturing technology (ASU), Material testing(ASU), Mechatronics (ASU and UoL), Robotics and Artificial Intelligence (UoL), Basic Mecharonics Workshop (NCT).

I participated with a team of academic staff to develop and design new curriculum for mechatronics engineering programs at Ain Shams University in 2013 and 2018 respectively. These curricula were organised around mutually supporting courses and based on CDIO (Conceive, Design, Implement, Operate.) concept.

TEACHING TRAINING COURSES

- Problem solving and decision making (Ain Shams University, Cairo, Egypt, 2018)
- Academic Writing (Ain Shams University, Cairo, Egypt, 2018)
- Use of technology in teaching (Ain Shams University, Cairo, Egypt, 2018)
- Preparing competitive research projects (Ain Shams University, Cairo, Egypt, 2017)
- Engagement Teaching in Engineering (University of Leeds, UK, 2014)
- Supervising Taught Student Dissertations and Projects (University of Leeds, UK, 2014)
- Learning and Teaching in Lectures (University of Leeds, UK, 2014)
- Teaching with the VLE (Virtual Learning Environment) at Leeds (University of Leeds, UK, 2014)
- Using technology in teaching (Ain Shams University, Egypt, 2007)
- Teaching Techniques (Ain Shams University, Egypt, 2007)
- Preparation of Academic Teaching Staff (Ain Shams University, Egypt, 2006)

TECHNICAL TRAINING COURSES

- 35 days training at Tianjin light industry vocational technical college in China about Application and Maintenance of CNC Equipment (June 2019-July 2019).

PUBLIC ENGAGEMENT AND IMPACT

- Leeds Robotics public open day (June 25, 2016, University of Leeds, Leeds, UK)
- Be Curious Festival: health & Welbeing (March 19, 2016, Mechanical Engineering, University of Leeds, Leeds, UK)
- Effective Mobility for Prosthetic Users (Lower extremity) (September 25, 2015, University of Leeds, Leeds, UK)
- Assistive Technologies and Rehabilitation (January 23, 2015, University of Leeds, Leeds, UK)
- Effective Mobility for Prosthetic Users (Upper and Lower extremities) (August 21, 2014, University of Leeds, Leeds, UK)

PRESENTATIONS

Public oral presentations, oral international conference presentations and poster presentations in international conferences.

LIST OF TECHNICAL WORKSHOPS ATTENDED

- National Intelligent Robotics Prototyping Workshop: Network, Collaborate and Create (March 5, 6, 12 & 13, 2016, Leeds, UK)
- Industrial Networking and Engagement Day on Soft Robotics Technologies (October 8, 2015, Bristol, UK)
- National Symposium on Field Robotics (March 5, 2015, Sheffield, UK)

ACHIEVEMENTS / AWARDS / PRIZES

- CLAWAR Association best technical paper in CLAWAR 2011 awarded for "Design of an Efficient Back-Drivable Semi-Active above Knee Prosthesis", September 2011, Paris, France.
- Winning the Ph.D. lab-poster prize for the Dynamics and Control Lab., University of Leeds, March 2012, Leeds, UK.

PROFESSIONAL MEMBERSHIPS

- **IEEE Membership (2011 - 2016)** Member of the Institute of Electrical and Electronics Engineers (IEEE). Started as a student member on 2011 and became a member on 2013.
- **Member of International Association of Engineers (IAENG member) (2011-2016)**

FUNDED PROJECTS

- Member of Ain Shams University team that participated in the TEMPUS project, MEDA 2004 for Mechatronics Curriculum Development, "Curricula Development for a New Mechatronics B.Sc. Major", 474,240.00Euro, JEP-32050-2004-MEKATRON.
- PI of "iGRASP (innovative Glove for Rehabilitation and Assistance using Smart-features and Performance)" project (CFP149) funded by Information Technology Industry Development Agency (ITIDA). (From August 2019 to December 2020)

CONSULTATIONS AND FIELD EXPERIENCES

- Technical evaluation of equipment installed at delta steel company of continuous casting production line and induction furnaces and preparing of the technical report, Cairo, Egypt, 2020.
- Technical evaluation of equipment installed at Arab Medical Equipment Company (AMECO) for their new automated production line, 10th of Ramadan City, Egypt, 2018.
- Supervising and preparing of the technical report of the assembly process and installation of the automated textile printing production line at El Chourbagui Textiles in addition to testing, 10th of Ramadan City, Egypt, 2004.

PEER REVIEW: REVIEWING SCIENTIFIC MANUSCRIPTS

I reviewed several scientific manuscripts for international journals (e.g. IEEE/ASME Transactions on Mechatronics, IEEE Journal on Robotics and Automation, etc.) and many international conferences (e.g. IEEE International Conference on Robotics and Automation (ICRA), IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), etc.).

APPENDIX I: PUBLICATIONS

BOOK CHAPTERS

1. Alireza Abouhossein, Uriel Martinez-Hernandez, **Mohammed I. Awad**, Imran Mahmood, Derya Yilmaz, and Abbas A. Dehghani-Sanij. "Assistive Gait Wearable Robots—From the Laboratory to the Real Environment." In Reinventing Mechatronics, pp. 75-92. Springer, 2020.
2. K. S. Tee, **M. Awad**, C. F. Soon, A. Dehghani, D. Moser, and S. Zehedi, "Ambulatory System For Gait Monitoring And Assessment" In R. Abdul Rahim, K. H. Abas, and N. A. M Subra., editors, Sensor & Instrumentation System Series 3, pages 95-118, Penerbit UTHM, 2017. ISBN 978-967-2110-27-9.

JOURNAL PAPERS

1. Tahir Hussain, Nadeem Iqbal, Hafiz Farhan Maqbool, Mukhtaj Khan, **Mohammed Ibrahim Awad**, Abbas A Dehghani-Sanij, "Intent based recognition of walking and ramp activities for amputee using sEMG based lower limb prostheses", Biocybernetics and Biomedical Engineering, 2020.
2. Omar T. Abdelaziz, Shady A. Maged, **Mohammed I. Awad**, "Towards Dynamic Task/Posture Control of a 4DOF Humanoid Robotic Arm", International Journal of Mechanical Engineering and Robotics Research, 2020.
3. Alireza Abouhossein, **Mohammed I. Awad**, Hafiz F. Maqbool, Carl Crisp, Todd Stewart, Neil Messenger, Robert C. Richardson, Abbas A. Dehghani-Sanij, and David Bradley, "Foot trajectories and loading rates in a transfemoral amputee for six different commercial prosthetic knees: An indication of adaptability", Medical engineering & physics, 2019.
4. H. F. Maqbool, M. A. B. Husman, **M. I. Awad**, A. Abouhossein, N. Iqbal, and A. A. Dehghani-Sanij, "Heuristic real-time detection of temporal gait events for lower limb amputees", IEEE Sensors Journal, 2019 (DOI: 10.1109/JSEN.2018.2889970)
5. M. Zarzoura, P. Del Moral, **M. I Awad**, and F. A. Tolbah, "Investigation into reducing anthropomorphic hand degrees of freedom while maintaining human hand grasping functions", Proceedings of the Institution of Mechanical Engineers, Part H: Journal of Engineering in Medicine, 2019
6. S. A. Abdelwahab, F. A. Tolbah, M. M. Abdelhameed, M. B. Trabia, and **M. I. Awad**, "Characterization and Control of IPMC for Use in Bio-inspired Actuators", International Journal of Mechanisms and Robotic Systems (ISSN 2047-7252), 4(3), pp.155-175, 2018.
7. Adrian Bee Tiong Soon, Kian Sek Tee, **Mohammed Ibrahim Awad**, and Chin Fhong Soon. "Oncoming Vehicle Detection with Variable-Focus Liquid Lens." International Journal of Integrated Engineering 10, no. 8 (2018).
8. H. F. Maqbool, M. A. B. Husman, **M. I. Awad**, A. Abouhossein, N. Iqbal, and A. A. Dehghani-Sanij, "A Real-Time Gait Event Detection for Lower Limb Prosthesis Control and Evaluation," IEEE Transactions on Neural Systems and Rehabilitation Engineering (ISSN: 1534-4320), Vol. 25, Issue 9, pp.1500-1509, 2017.
9. A. A. Ibrahim, **M. I. Awad**, A. A. Alnaqi, A. A. Abdel Kader, and F. A. Tolbah, "Features Selection and Pattern Classification of Electroencephalography Motor Imagery Tasks of Right Hand", Research Journal of Applied Sciences, Engineering and Technology (ISSN 2040-7467), 14(10): 372-379, 2017.
10. A. S. B.Tiong, S. C. Fhong, R. Omar, **M. I. Awad**, and K. S. Tee, "Lane Marking Detection and Tracking", ARPN Journal of Engineering and Applied Sciences (ISSN 1819-6608), Volume 11, Issue 14, Pages 8910-8914, 2016.
11. Z. W. Lui, **M. I. Awad**, A. Abouhossein, A. A. Dehghani-Sanij, and N. Messenger, "Virtual prototyping of a semi-active transfemoral prosthetic leg," Proceedings of the Institution of Mechanical Engineers, Part H: Journal of Engineering in Medicine (ISSN 2041-3033), vol. 229, pp. 350-361, 2015.
12. F. A. Tolbah, M. M. Abdelhameed, **M. I. Awad**, and S. A. Abdelwahab, "Towards development of a bio-inspired artificial muscle using IPMC for potential applications in robotics," International Journal of Mechanisms and Robotic Systems (ISSN 2047-7252), vol. 2, pp. 341-364, 2015.
13. F. Tolbah, M. Abdelhameed, **M. I. Awad**, "Analysis and Control of A Hybrid Robot-Based Machine Table", Scientific Bulletin, Faculty of Engineering, Ain Shams University, Vol. 2, No. 40, June, 2005.

PEER-REVIEWED FULL CONFERENCE PAPERS

1. S. A. Mohamed, **M. I. Awad** and S. A. Maged, "Online Gait Generation For NAO Humanoid Robot Using Model Predictive Control," 2020 International Conference on Innovative Trends in Communication and Computer Engineering (ITCE), Aswan, Egypt, 2020, pp. 205-209, doi: 10.1109/ITCE48509.2020.9047782.

2. A. Halim, A. A. Ibrahim, **M. I. Awad** and M. R. A. Atia, "Optimization of Sensor Number for Lower Limb Prosthetics using Genetic Algorithm," 2020 International Conference on Innovative Trends in Communication and Computer Engineering (ITCE), Aswan, Egypt, 2020, pp. 210-215, doi: 10.1109/ITCE48509.2020.9047780.
3. A. Adel, M. Mahmoud, N. Sayed, O. Hisham, O. Ossama, P. Adel, Y. Ayman, **M. I. Awad**, S. A. Maged, S. M. Umer, H. Iqbal, H. F. Maqbool, "Design of A 6-DOF Hydraulic Vehicle Driving Simulator," 2020 International Conference on Innovative Trends in Communication and Computer Engineering (ITCE), Aswan, Egypt, 2020, pp. 170-175, doi: 10.1109/ITCE48509.2020.9047787.
4. M. N. El-Agroudy, M Gaber, D Joseph, M Ibrahim, M Amin, D Helmy, M Hanafy, S Hisham, **M. I. Awad**, A. R. Youssef, S. A. Maged, "Assistive Exoskeleton Hand Glove," 2020 International Conference on Innovative Trends in Communication and Computer Engineering (ITCE), Aswan, Egypt, 2020, pp. 164-169, doi: 10.1109/ITCE48509.2020.9047803.
5. Ahmed Mobrez, Muhammad El-Brollossy, Muhammad Yehia, **Mohammed I. Awad**, Shady A. Maged, Dilruba Siddiqi, Hafiz F. Maqbool, "Microprocessor-Based Hydraulic Damping-Controlled Prosthetic Knee for Developing Countries," 2019 International Conference on Robotics and Automation in Industry (ICRAI), Rawalpindi, Pakistan, 2019, pp. 1-6, doi: 10.1109/ICRAI47710.2019.8967393.
6. S. A. Mohamed, S. A. Maged and **M. I. Awad**, "Design and Control of the Lower Part of Humanoid Biped Robot," 2018 3rd International Conference on Robotics and Automation Engineering (ICRAE), Guangzhou, China, pp. 19-23, 2018. doi: 10.1109/ICRAE.2018.8586705
7. Alireza Abouhossein, Uriel Martinez Hernandez, **Mohammed I. Awad**, David Bradley, and Abbas A. Dehghani-Sanij. "Human-activity-centered measurement system: challenges from laboratory to the real environment in assistive gait wearable robotics." In 16th Mechatronics Forum International Conference, 2018.
8. U. Martinez-Hernandez, **M. I. Awad**, I. Mahmood, and A. A. Dehghani-Sanij, "Prediction of gait events in walking activities with a Bayesian perception system", 2017 IEEE-RAS-EMBS International Conference on Rehabilitation Robotics (ICORR 2017), London, UK, 17-20 July, 2017.
9. M. A. Husman, H. F. Maqbool, **M. I. Awad**, and A. Dehghani-Sanij, "Portable Haptic Device for Lower Limb Amputee Gait Feedback: Assessing Static and Dynamic Perceptibility", 2017 IEEE-RAS-EMBS International Conference on Rehabilitation Robotics (ICORR 2017), London, UK, 17-20 July, 2017.
10. M. A. Arafa, **M. I. Awad**, and F. A. Tolbah, "Proportional myoelectric prosthetic hand control using multiregression model estimator with pattern classifier selector", IEEE International Workshop on Advanced Robotics and its Social Impacts (ARSO 2017), Austin, USA, 8-10 March, 2017.
11. Z. Muhammad, H. F. Maqbool, T. Hussain, **M. I. Awad**, P. Mehryar, N. Iqbal, and A. A. Dehghani-Sanij, "Heuristic Based Gait Event Detection for Human Lower Limb Movement", International Conference on Biomedical and Health Informatics (BHI 2017), Orlando, Florida, USA, 16-19 February, 2017.
12. **M. I. Awad**, A. Abouhossein, B. Chong, A. A. Dehghani-Sanij, R. Richardson, D. Moser and S. Zahedi, "Investigation into Energy Efficiency and Regeneration in an Electric Prosthetic Knee", International Conference on Neurorehabilitation, Segovia, Spain, 18-21 October, 2016.
13. H. F. Maqbool, M. A. B. Husman, **M. I. Awad**, A. Abouhossein, N. Iqbal and A. A. Dehghani-Sanij, "Stance Sub-Phases Gait Event Detection in Real-time for Ramp Ascent and Descent", International Conference on Neurorehabilitation, Segovia, Spain, 18-21 October, 2016.
14. A. Abouhossein, **M. I. Awad**, C. Crisp, A. A. Dehghani-Sanij, N. Messenger, T.D. Stewart, O. M. Querin, R. Richardson, D. Bradley, "Gait abnormalities of above knee amputees, is it a design deficiency or compensatory strategy?", International Conference on Neurorehabilitation, Segovia, Spain, 18-21 October, 2016.
15. **M. I. Awad**, A. Abouhossein, A. Dehghani-Sanij, R. Richardson, D. Moser, S. Zahedi, and D. Bradley, "Towards a Smart Semi-Active Prosthetic Leg: Preliminary Assessment and Testing", in 7th IFAC Symposium on Mechatronics & 15th Mechatronics Forum International Conference, Loughborough, UK, 5-8 September, 2016.
16. H. Maqbool, M. Husman, **M. I. Awad**, A. Abouhossein, P. Mehryar, N. Iqbal, and A. Dehghani-Sanij, "Real-time gait event detection for lower limb amputees using a single wearable sensor", in 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Orlando, FL, USA, 16-20 August 2016.
17. M. Husman, H. Maqbool, **M. I. Awad**, A. Abouhossein, and A. Dehghani-Sanij, "A Wearable Skin Stretch Haptic Feedback Device: Towards Improving Balance Control in Lower Limb Amputees", in 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Orlando, FL, USA, 16-20 August 2016.
18. **M. I. Awad**, A. Abouhossein, A. Dehghani-Sanij, R. Richardson, O. Querin, D. Moser, and S. Zahedi, "Estimation of Actuation System Parameters for Lower Limb Prostheses", in 17th International Conference on Research and Education in Mechatronics, France, 15-17 June, 2016.

19. **M. I. Awad**, A. Dehghani-Sanij, D. Moser, and S. Zahedi, “Motor Electrical Damping for Back-Drivable Prosthetic Knee”, in 17th International Conference on Research and Education in Mechatronics, France, 15-17 June, 2016.
20. H. F. Maqbool, M. A. B. Husman, **M. I. Awad**, A. Abouhossein, and A. A. Dehghani-Sanij, "Real-time gait event detection for transfemoral amputees during ramp ascending and descending," 37th Annual International Conference of the IEEE in Engineering in Medicine and Biology Society (EMBC), pp. 4785-4788, 2015.
21. M. M. Hamdi, **M. I. Awad**, M. M. Abdelhameed, and F. A. Tolbah, "Lower limb gait activity recognition using Inertial Measurement Units for rehabilitation robotics," International Conference in Advanced Robotics (ICAR), pp. 316-322, 2015.
22. **M. I. Awad**, A. Dehghani-Sanij, D. Moser, and S. Zahedi, "Inertia Properties of a Prosthetic Knee Mechanism," in Towards Autonomous Robotic Systems. vol. 9287, C. Dixon and K. Tuyls, Eds., ed: Springer International Publishing, pp. 38-43, 2015.
23. H. Maqbool, P. Mehryar, M. Husman, **M. I. Awad**, A. Abouhossein, and A. Dehghani-Sanij, "Towards Intelligent Lower Limb Prostheses with Activity Recognition," in Towards Autonomous Robotic Systems. vol. 9287, C. Dixon and K. Tuyls, Eds., ed: Springer International Publishing, pp. 180-185, 2015.
24. M. M. Hamdi, **M. I. Awad**, M. M. Abdelhameed, and F. A. Tolbah, "Lower limb motion tracking using IMU sensor network," Cairo International in Biomedical Engineering Conference (CIBEC), pp. 28-33, 2014.
25. F. A. Tolbah, M. M. Abdelhameed, **M. I. Awad**, and S. A. Abdelwahab, "Modeling and simulation of a new bioinspired muscle actuator," 15th International Workshop on Research and Education in Mechatronics (REM), pp. 1-7, 2014.
26. **M. Awad**, A. Dehghani, David Moser, and Saeed Zahedi, “Dynamic Coupling Characteristics of a Semi-Active Knee Prosthesis”, CLAWAR 2013, Sydney, Australia, 14 – 17 July, 2013.
27. **M. Awad**, K. Sek Tee, Abbas A. Dehghani-Sanij, David Moser, and Saeed Zahedi, “Analysis and Performance of A Semi-Active Prosthetic Knee”, Proceedings of the International Conference on Mechanical Engineering and Mechatronics (ICMEM 2012), Ottawa, Ontario, Canada, 16-18 August 2012.
28. **M. Awad**, K. Sek Tee, A. Dehghani, David Moser, and Saeed Zehedi ,“Design of An Efficient Back-Drivable Semi-Active Above Knee Prosthesis”, Proceedings of CLAWAR 2011: the 14th International Conference on Climbing and Walking Robots and the Support Technologies for Mobile Machines, pp. 35-42, Paris, France, 6 – 8 September 2011.
29. Z. Lui, **M. Awad**, A. Dehghani, and Neil Messenger, “Virtual Modelling, Prototyping and Simulation of Transfemoral Active Prosthetic Limb”, Proceedings of CLAWAR 2011: the 14th International Conference on Climbing and Walking Robots and the Support Technologies for Mobile Machines, pp. 759-766, Paris, France, 6 – 8 September 2011.
30. K. Sek Tee, **M. Awad**, A. Dehghani, David Moser, and Saeed Zehedi, “A Portable Gait Monitoring System for Lower Limb Prosthetic Alignment”, Proceedings of the World Congress on Engineering 2011 Vol. III WCE 2011, London, U.K, July 6 - 8, 2011.
31. K. Sek Tee, **M. Awad**, A. Dehghani, David Moser, and Saeed Zehedi, “Dynamic Calibration of A Gyroscope Using A Compound Pendulum”, Proceedings of CLAWAR 2011: the 14th International Conference on Climbing and Walking Robots and the Support Technologies for Mobile Machines, pp. 825-830, Paris, France, 6 – 8 September 2011.
32. K. Sek Tee, **M. Awad**, A. Dehghani, David Moser, and Saeed Zehedi, “Triaxial Accelerometer Static Calibration”, Proceedings of the World Congress on Engineering 2011 Vol. III WCE 2011, London, U.K, July 6 - 8, 2011.
33. K. Sek Tee, **M. Awad**, A. Dehghani, David Moser, and Saeed Zehedi, “Comparison of Two Static Calibration Methods of An Inertial Measurement Unit”, Proceedings of the IASTED International Conference Biomedical Engineering (Biomed 2011), Innsbruck, Austria, February 16 - 18, 2011.
34. F. Tolbah, M. Abdelhameed, **M. I. Awad**, “A Mechatronics Approach for the Design of a Parallel Robot Based Machine Tool Platform", 7th International Conference on Production Engineering and Design for Development, Cairo-Egypt, (PEDD7) Proceedings, pp.53-72, February 7-9, 2006.

ONE-PAGE ABSTRACT CONFERENCE PAPAER

1. A. Abouhossein, **M. I. Awad**, C. Crisp, A. Dehghani-Sanij, N. Messenger, T. Stewart, O. Querin, R. Richardson, and D. Bradley, "Effect of different prosthetic knees/feet on the roll-over", International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Orlando, FL, USA, 16-20 August 2016.
2. **M. I. Awad**, A. Abouhossein, A. A. Dehghani-Sanij, R. C. Richardson, O. M. Querin, D. Moser, and S. Zahedi, "Estimation of Prosthetic Knee Actuation System Requirements”, ," in 37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC), Milan, Italy, 25-29 August 2015.

3. **M. I. Awad**, A. Abouhossein, A. A. Dehghani-Sanij, R. C. Richardson, O. M. Querin, D. Moser, and S. Zahedi, "Estimation of Actuation System Parameters for Prosthetic Ankle", in Medical Engineering and The Bioengineering Society Annual Conference (MEIbioeng15), Leeds, 7-8 September 2015.
4. J. W. Kow, **M. I. Awad**, and A. A. Dehghani-Sanij, " Towards Self-Tuning Lower Limb Prosthesis", in Medical Engineering and The Bioengineering Society Annual Conference (MEIbioeng15), Leeds, 7-8 September 2015.
5. P. Mehryar, H. F. Maqbool, **M. I. Awad**, A. Abouhossein and A. A. Dehghani-Sanij, "Investigation of above knee muscles for event detection using surface electromyography", in Medical Engineering and The Bioengineering Society Annual Conference (MEIbioeng15), Leeds, 7-8 September 2015.
6. H. F. Maqbool, M. A. B. Husman, **M. I. Awad**, A. Abouhossein and A. A. Dehghani-Sanij, " Real-time gait event detection using a miniature gyroscope to improve rehabilitation for artificial lower limb users", IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2015), Hamburg, Germany, 2015.
7. A. Abouhossein, **M. I. Awad**, C.Crisp, A. A. Dehghani-Sanij, N. Messenger, T.D. Stewart, O. M. Querin, R. Richardson, D. Moser, S. Zahedi, and D. Bradley, "Impact of a viscoelastic parameters of a prosthetic ankle on the knee power over level ground walking", IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2015), Hamburg, Germany, 2015.
8. **M. I. Awad**, A. Abouhossein, C.Crisp, A. A. Dehghani-Sanij, R. Richardson, D. Moser, and S. Zahedi, "A Smart Biomimetic and Self Tuning Lower Limb Prosthesis to Improve Rehabilitation", IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2015), Hamburg, Germany, 2015.
9. A. Abouhossin, **M. I. Awad**, A. A. Dehghani-Sanij, O. M. Querin, R. Richardson, TD. Stewart, N. Messenger, D. Bradley, D. Moser, and S. Zahedi, “Controller design for a Semi-Active Transfemoral Prosthetic Knee based on Angular Velocity Monitoring”, International conference on Computer methods in biomedical and biomechanical engineering (CMBBE), Montreal, Canada, 1-5 September 2015.
10. A. Abouhossein, **M. I. Awad**, A. Dehghani, N. Messenger, “Understating the mechanism of transient impulsive forces during certain activities of daily living for amputee and able-bodied”, Royal Academy of Engineering, Conference for Young researchers future meeting, Sept. 15-17, 2014.