

Brief Biography

ADEL AL-JUMAILY (PhD, MSc., BSc.)

Associate Professor, Faculty of Engineering and IT, University of Technology Sydney (UTS)

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Adjunct Associate Professor, School of Engineering, Edith Cowan University (ECU)

Adjunct Associate Professor, School of Computing and Mathematics, Charles Sturt University.

Adel researcher and academic leader with more than 20 years' experience. He had designed, taught, coordinated more than 20 subjects and designed two degrees. He has published more than 230 peer reviewed papers with high quality journals and international conferences. He has 6 best paper awards and 11 patents that 10 of them sponsored by industry. His google scholar citation is 2902 with high index 28 (by 4 Dec. 2020), he supervised more than 40 of PhD and master students.

Academic leader positions

- Research leader
- Program Head of Biomedical Engineering degree.
- Chairman of Student Assessment Review Committee
- Program Head of Computer Systems Engineering
- Program and Software Engineering Program.
- Group Head of Intelligent System Engineering Group (ISE).
- Group Leader of a team of researchers in Robotics fields

Research area:

Leader and researcher in Computational Intelligence, Humanized Computational Intelligence based technology, Health Technology, Bio- Mechatronics Systems, Bio-signal/ Image pattern recognition, Machine Learning, and Vision based cancer diagnosing.

Part of his research is about the fusion and integration of the data that built based on the concept that the mammalian brain integrated different sensory modalities by multisensory integration to one modality representation for deep neural network. The tensor representation in a multi-dimensions' matrix will correctly acquire the correlation between the singles and the behaviour.

Adel developed Computational Intelligence based on Electromyogram (EMG) control of prosthetic devices for rehabilitation and contributed to Electroencephalogram (EMG and EEG) techniques, and a new approach for Deep learning with small data for image processing in cancer detection, He has successfully developed many nature-based algorithms to solve the bio-signal/ Image pattern recognition computational intelligence problems.

He is working in cross-disciplinary applied research area and established his international track record. He has built many systems and wearable deceives that controlled based on the development of a novel techniques in extreme learning machine and realistic Computational intelligence.

Experience: More than 25 years' solid experience with emphasis on teaching, research, and hands-on work. Work as team leader and researcher, Program Head for many degrees.

Patents: 11 patents (3 International (2019, 2016, 2013), 1 United States (2018), 2 Australian (2016,2015), 5 Provisional Australian patents (2018,2017,2016,2016, 2015).

Projects (designed, developed and implemented): **More than 17 projects**

Some of current projects:

- Computational intelligence-based Electromyogram (EMG) control of prosthetic and assistive devices for rehabilitation.
- Design and Development of a Post Stroke Bilateral Therapeutic Hand Device.
- Machine learning based Myoelectric control for exoskeleton prosthetic devices.

- Lower Limb and Foot Rehabilitation.
- Augmented Reality Rehabilitation Exercises and Biofeedback.
- Rehabilitation after Stroke (with interaction of Port Kembla Hospital and senior rehabilitation staff in UAE).
- Automated Classification of Foot Drop Rehabilitation (with Metro Rehabilitation Hospital in Sydney, Australia).
- Predication of short term and long-term rehabilitation effectiveness (with the Brain Science Institute (BSI), RIKEN, Japan)
- Tremor Suppression for Human Hand with Soft Robot (with Cognitive Neuroscience, Brain and Mind Centre, Sydney).
- Children Rehabilitation: Clubfoot new classification system and 3D printing (with Children's Hospital at Westmead, Sydney).
- Enhancement of Social Interaction for Children with Autism (with Italian research centre and autism united states).
- Image processing-based cancer diagnosing (Sydney cancer institute and Wollongong pathologist)
- Meat quality and animal health (image processing Sydney University).

Research Grants: around AUD 7 million+ new CRC

Higher Degree Students Supervision

- Currently Supervising: **4 PhD students**
- Since 2009:**16 higher degree** students graduated under his supervision (15 Ph.D. and one master by research)

Supervision Award: Two Awards, 2016 and 2015 Faculty of Engineering and Information Technology Higher Degree Research Supervision Completion Award.

Prizes and Recognitions

-Best Paper Award: **6 BEST PAPER AWARDS** (2018, 2017, 2016, 2013, and 2012 (two))

Some recent achievements:

- ENTRY PRIZE of the Australia Divisional Final of the First Innovation & Entrepreneurship International Competition Shenzhen, China (out of more than 100 projects), April 2017.
- Recognition of Invention certification from ResMed company for international joint patent “your contribution is recognised as being important to the success of RESMED”, Dec 2016.
- Fully sponsored travel to China for Participate in final talent competition organized by Shenzhen government.
- Invitation to 2017 Global Smart Industry Innovation Conference and Global Innovation Technology Transfer Convention and B2B meeting with Suzhou Institute of Biomedical Engineering and Technology, China (fully sponsored).
- Certificate of appreciation for conducting series of lectures on teaching innovation and active learning from University of Petronas, Malaysia, 7-8 Feb. 2017.

Engagement: Professional, Conferences, and Seminars:

-**30** invited conferences and seminars speakers;

-**33 PROGRAM CHAIR**

-**124 MEMBER OF TECHNICAL PROGRAM COMMITTEE**

- **20 CHAIRMAN OF SESSIONS**

-**Organizing many conference, workshop, symposium, and special session**

Appointment: Appointed as a visiting scholar for international four Universities

Senior Member of the International Institute of Electrical and Electronic Engineers (IEEE); member for 9 other professional societies.

Co-Vice Chair of IEEE Computational Intelligence chapter in NSW section (one of the founders) since 2018.

Vice-Chair IEEE New South Wales Section, Robotics and Automation Society Chapter since 2019
Associate-editor of Annual International Conference of the IEEE Engineering in Medicine and Biology Society (2107- present)

Editorial Board Memberships for 20 Journals (in different time) that including *Associate Editors-in-Chief of two Journals*

Research partners: More than 18 research partners from medical and industry, in addition to academia.

PUBLICATIONS (Over 230 peer reviewed articles)

Journal Papers: (selected from 2017-2019 Journals high ranks)

1. Vinh Phuc Tran, and Adel Ali Al-Jumaily, "A Novel Oxygen-Hemoglobin Model for Non-Contact Sleep Monitoring of Oxygen Saturation", *IEEE Sensors Journal*, Volume: 19, Issue, pp 2412325-12332, 2019
2. Sahar Adil Abboud, Saba Al-Wais, Salma Hameedi Abdullah, Fady Alnajjar, Adel Al-Jumaily, "Label Self-Advised Support Vector Machine (LSA-SVM): Automated Classification of Foot Drop Rehabilitation Case Study", *Biosensors*, Sept. 2019, Biosensors 2019, 9, 114; DOI:10.3390/bios9040114.
3. Ganesan Balasankar, Tejashwini Gowda, Adel Al-Jumaily, Kenneth Fong, Surendra Kumar Meena, & Raymond Tong (2019), "Ambient assisted living technologies for older adults with cognitive and physical impairments: a review", *European Review for Medical and Pharmacological Sciences*, 2019; 23 (23): 10470-10481, DOI: 10.26355/eurrev_201912_19686
4. Mohammad Omar Wedyan, Alessandro Crippa, Adel Al-Jumaily, "A novel virtual sample generation method to overcome the small sample size problem in computer aided medical diagnosing", *Algorithms*, August 2019, DOI:10.3390/a12080160.
5. Maen Takruri, Adel Al-Jumaily, "PSO-SVM Hybrid System for Melanoma Detection from Histo-pathological Images", *International Journal of Electrical and Computer Engineering (IJECE)*, 2019. DOI: <http://doi.org/10.11591/ijece.v9i4.pp%25p>.
6. Balasankar Ganesan, Joanne Yip, Adel Al-Jumaily, Shirley SM Fong, Ana M Ey Battle, Kenneth N.K. Fong, Ameersing Luximon, " A novel 3D evaluation method for assessing bone to bone relationships in clubfoot ", *European Review for Medical and Pharmacological Sciences Journal*, 2019. 2019; 23: 1882-1890.
7. Seyedehmarzieh Hosseini, Adel Al-Jumaily "Analytical solution for forced vibration of piezoelectrically actuated Timoshenko beam", *Journal of Intelligent Material Systems and Structures*, 2019. DOI <https://doi.org/10.1177/1045389X19832118>.
8. Zehong Cao, Yu-Kai Wang, Weiping Ding, Farookh Hussain, Adel Al-Jumaily, Chin-Teng Lin, "Effects of Repetitive SSVEPs on EEG Complexity using Multiscale Inherent Fuzzy Entropy", *Neurocomputing journal*, Elsevier, eprint arXiv:1809.06671, 2018.
9. Pornchai Phukpattaranont, Sirinee Thongpanja, Khairul Anam, Adel Al-Jumaily, and Chusak Limsakul, "Evaluation of feature extraction techniques and classifiers for finger movement recognition using surface electromyography signal", *Medical and Biological Engineering and Computing*, 56, 2259–2271 (2018) doi:10.1007/s11517-018-1857-5.
10. Balasankar Ganesan, Ameersing Luximon, Adel Al-Jumaily, Joanne Yip, Paul J. Gibbons, Alison Chivers "Developing a three-dimensional (3D) assessment method for clubfoot- A study protocol". *Frontiers in physiology journal*, Volume 8, 2018, article 1098, DOI=10.3389/fphys.2017.01098.
11. Khairul Anam, Adel Al-Jumaily, "Optimized Kernel Extreme Learning Machine for Myoelectric Pattern Recognition", *International Journal of Electrical and Computer Engineering (IJECE)*, Vol 8, No 1, 2018.
12. Balasankar Ganesan, Ameersing Luximon, Adel Al-Jumaily, Suchita Kothe Balasankar, and Ganesh R. Naik, " Ponseti method in the management of clubfoot under 2 years of age: A systematic review", *PLoS One*. 2017; 12(6), e0178299. DOI:10.1371/journal.pone.0178299
13. R. N. Khushaba, A. Al-Timemy, A. Al-Ani, and A. Al-Jumaily, "A Framework of Temporal-Spatial Descriptors based Feature Extraction for Improved Myoelectric Pattern Recognition", *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, Volume: 25, Issue:10, pp 1821-1831, 2017.

14. Khairul Anam, Adel Al Jumaily, "Evaluation of Extreme Learning Machine for Classification of Individual and Combined Finger Movements using Electromyography on Amputees and Non-amputees", *Neural Networks Journal*, Volume 85, January 2017, Pages 51–68.