

# Mohammad Ahmad Al-Abed, PhD, PMP

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<b>Academic and Professional Experience</b>	<b>Associate Professor</b> , Biomedical Engineering Department, The Hashemite University <i>Aug 2020 - Present</i>
	<b>Assistant Professor</b> , <i>Biomedical Engineering Department</i> , The Hashemite University <i>Sept 2011 - Aug 2020</i>
	<b>Graduate Research Assistant</b> , <i>Bioengineering Department</i> , University of Texas at Arlington <i>Jan 2007- Aug 2011</i>
	<b>Graduate Teaching Assistant</b> , <i>Bioengineering Department</i> , University of Texas at Arlington <i>Jan 2006 – Dec 2006</i>
	<b>Radio Measurements</b> , <i>Jordan Data Communications Ltd. (Orange Jordan)</i> , Amman, Jordan <i>Dec 2002-Jan 2004</i>
<b>Administrative Experience</b>	<b>Director, Center for Renewable Energy, Water and the Environment</b> , <i>The Hashemite University</i> <i>Dec 2019 - present</i>
	<b>Chair, Biomedical Engineering Department</b> , <i>Faculty of Engineering</i> , The Hashemite University <i>Sept 2019-Aug 2020</i> <i>Sept 2015- Sept 2016</i>
	<b>Assistant Dean of Engineering for Industrial Outreach and Training</b> , <i>Faculty of Engineering</i> , The Hashemite University <i>Sept 2016- Sept 2017</i> <i>Sept 2014-Sept 2015</i>
	<b>Assistant Dean of Engineering for Student Affairs and Training</b> , <i>Faculty of Engineering</i> , The Hashemite University <i>Sept 2012- Sept 2014</i>
<b>Education</b>	<b>Ph.D., Bioengineering</b> <i>August, 2011</i> <i>The University of Texas at Arlington and the University of Texas Southwestern Medical Center at Dallas</i> Dissertation title: “Non-Invasive Real-Time Detection of Obstructive Sleep Apnea Events using Ultrasound”.
	<b>MSc, Biomedical Engineering</b> <i>May, 2006</i> <i>The University of Texas at Arlington and the University of Texas Southwestern Medical Center at Dallas</i> Thesis title: “A Novel Approach in the Detection of Obstructive Sleep Apnea from Electrocardiogram Signals Using Neural Network Classification of Textural Features Extracted from Time-Frequency Plots”.
	<b>B.Sc., Electrical Engineering – Communications and Electronics</b> <i>August, 2002</i> <i>Jordan University of Science and Technology, GPA 84.8% (Excellent)</i>
	<b>High School Diploma (Tawjihi) – Scientific Track</b> <i>July, 1997</i> <i>Jubilee School for Gifted &amp; Talented Students – Overall Score 95.4%</i>

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**Engineering  
Projects,  
Committees, and  
Consultation  
Experience**

- Member of the Technical Committee for the installation of **16 MW AC solar stations at the University of Jordan**, April 2016 – August 2017.
  - Preparation of the tendering documents, specifications, and general and special conditions based on FIDIC requirements and local regulations.
  - Organized and implemented all bidder visits and amendments
- Member of the Technical and Supervision Committee for the installation of **750 kWp solar stations at the Prince Mohammad Sports Complex**, Zarqa, February 2017 – June 2018.
- Member of the Technical Committee for the installation of **5 MWp solar stations at the Hashemite University**.
  - Preparation of the tendering documents based on FIDIC and local regulations
  - Call for tender, bidder visits and amendments
  - Evaluation of offers
  - Low and medium voltage stations
  - 1 MWp as solar canopies
  - JD 5.9 million
  - September 2012 – November 2015
- Member of the Technical Committee for the selection of the consultant for the installation of **5MW solar stations at the Hashemite University**.
  - Preparation of the tendering documents
  - Call for tender, bidder visits and amendments
  - Evaluation of offers
  - May 2014 – February 2015
- Member of the Consultation Committee for the installation of **5MW solar stations at the Hashemite University**.
  - **1 MWp Site Manager**
  - Consultation on the plans, operation, installation, mitigation, and commissioning of the plant.
  - Sept 2015 – June 2016
- Member of the Technical Evaluation Committee for the selection of the contractor for the construction of the **Southern and Northern Class Complex Hall at the Hashemite University**.
  - 16,000 m<sup>2</sup> and 18,000 m<sup>2</sup>
  - JD 20 million
  - September 2013 – May 2014
- Member of the Technical Evaluation Committee for the selection of the supervision of the construction of both the **Northern and Southern Class Complex Halls at the Hashemite University**.
  - 16,000 m<sup>2</sup>
  - JD 500,000
  - September 2013 – January 2014
- Member of the Technical Evaluation Committee for the selection of the consultant for the design of the **Pharmacy Faculty Building at the Hashemite University**.
  - 16,000 m<sup>2</sup>
  - September 2014 - February 2015
- Member of the Technical Committee for the selection of the contractor for the construction of the **Civil Engineering Structural Systems Lab (SSL) at Hashemite University**.
  - Preparation of the tendering documents
  - Call for tender, bidder visits and amendments
  - Evaluation of offers
  - January 2015 – June 2016
- Member of the Technical Committee for the selection of the contractor for the construction of the **Water Desalination Plant at Hashemite University**.
  - Preparation of the tendering documents
  - Call for tender, bidder visits and amendments
  - Evaluation of offers
  - January 2017 – June 2017
- Chair of the Technical Evaluation Committee for the selection of the contractor for the construction of the **Civil Defense Facilities at the Hashemite University**, September 2016.

- S. Nijmeh, B. Hammad, **M. Al-Abed**, R. Bani-Khalid, "A Technical and Economic Study of a Photovoltaic–phase Change Material (PV-PCM) System in Jordan", in *Jordan Journal of Mechanical and Industrial Engineering*, vol. 14 (4), pp. 371-379, **2020**.
- S. Al-Jahawsheh, B. Na'amneh, D. Al-Batayha, **M. Al-Abed**, " Analysis of Corrected QT Interval Dispersion (QTcd) in Normotensive Subjects Performing Breath-hold Challenge," in *2020 IEEE 5th Middle East and Africa Conference on Biomedical Engineering*, pp. 1-5, **2020**.
- **M. A. Al-Abed**, A. K. Al-Bashir, A. Al-Rawashdeh, R. M. Alex, R. Zhang, D. E. Watenpaugh, and K. Behbehani, "Estimation of cerebral blood flow velocity during breath-hold challenge using artificial neural networks", in *Computers in Biology and Medicine*, vol. 115, **2019**.
- **M. A. Al-Abed**, A. K. Al-Bashir, O. A. Saraereh, F. A. Al-Refaie, R. A. Qaqi, S. M. Al-Marahlah, and Y. E. Saleh, "Computer Simulated Assessment of Radio Frequency Electromagnetic Waves for the Detection of Obstructive Sleep Apnea", *Informatics in Medicine Unlocked*, Elsevier, Aug, **2019**.
- **M. Al-Abed**, A. K. Al-Bashir, N. Obeidat, S. A. Alzyoud, M. Abu Khalaf, M. Obeidat, S. AlRyalat, H. Abu Khadra, M. Jalamneh, R. Al-Bluwi, and W. Al-Omari, "Quantifying Long QT Syndrome in Obese Sleep Apnea Patients Undergoing Roux-en-Y Gastric Bypass Surgery", *Engineering in Medicine and Biology Society (EMBC), 2019 41st Annual International Conference of the IEEE*, pp 4998-5001, **2019**.
- W. Al-Kouz, S. Al-Dahidi, B. Hammad, and **M. Al-Abed**, "Modeling and Analysis Framework for Investigating the Impact of Dust and Temperature on PV Systems' Performance and Optimum Cleaning Frequency," *Applied Sciences*, vol. 9, p. 1397, **2019**.
- M. Kharabsheh, O. Meqdadi, **M. Alabed**, S. Veeranki, A. Abbadi and S. Alzyoud, "A Machine Learning Approach for Predicting Nicotine Dependence" *International Journal of Advanced Computer Science and Applications (IJACSA)*, 10(3), pp. 179-184, **2019**.
- A. K. Al-Bashir, **M. A. Al-Abed**, H. K. Amari, F. M. Al-Rousan, O. M. Bashmaf, E. W. Abdulhay, et al., "Computer-based Cobb angle measurement using deflection points in adolescence idiopathic scoliosis from radiographic images," *Neural Computing and Applications*, pp. 1-15, **2018**.
- A. Al-Bashir, **M. Al-Abed**, H. Amari, E. Abdulhay, F. AlRousan, R. Jahmani, " A Clinical Based Semi-Automatic Algorithm for Developmental Dysplasia of the Hip Assessments in Ultrasound Images," *Journal of Medical Imaging and Health Informatics*, vol. 7(8), pp. 1789-1797, **2017**.
- B. Hammad, **M. Al-Abed**, A. Al-Ghandoor, A. Al-Sardeah, and A. Al-Bashir, "Modeling and analysis of dust and temperature effects on photovoltaic systems' performance and optimal cleaning frequency: Jordan case study," *Renewable and Sustainable Energy Reviews*, vol. 82, pp. 2218-2234, **2018**.
- **M. Al-Abed**, P. Antich, D. E. Watenpaugh, and K. Behbehani, "Phantom study evaluating detection of simulated upper airway occlusion using piezoelectric ultrasound transducers," *Computers in biology and medicine*, vol. 89, pp. 325-336, **2017**.
- B. Hammad, A. Al-Sardeah, **M. Al-Abed**, S. Nijmeh, and A. Al-Ghandoor, "Performance and economic comparison of fixed and tracking photovoltaic systems in Jordan," *Renewable and Sustainable Energy Reviews*, vol. 80, pp. 827-839, **2017**.
- A. K. Al-Bashir, **M. Al-Abed**, F. M. A. Sharkh, M. N. Kordeya, and F. M. Rousan, "Algorithm for automatic angles measurement and screening for Developmental Dysplasia of the Hip (DDH)," in *Engineering in Medicine and Biology Society (EMBC), 2015 37th Annual International Conference of the IEEE*, **2015**, pp. 6386-6389.
- B. K. Hammad, S. M. Rababeh, **M. A. Al-Abed**, and A. M. Al-Ghandoor, "Performance Study of On-Grid Thin-Film Photovoltaic Solar Station as a Pilot Project for Architectural Use," *Jordan Journal of Mechanical & Industrial Engineering*, vol. 7, **2013**.
- **M. A. Al-Abed**, P. Antich, D. E. Watenpaugh, and K. Behbehani, "Upper airway occlusion detection using a novel ultrasound technique," in *Engineering in Medicine and Biology Society (EMBC), 2012 Annual International Conference of the IEEE*, **2012**, pp. 5650-5653.
- R. Alex, G. Bhave, **M. A. Al-Abed**, A. Bashaboyina, S. Iyer, D. E. Watenpaugh, et al., "An investigation of simultaneous variations in cerebral blood flow velocity and arterial blood pressure

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during sleep apnea," in Engineering in Medicine and Biology Society (EMBC), 2012 Annual International Conference of the IEEE, **2012**, pp. 5634-5637.

- G. Hassan, R. Alex, G. Bhave, **M. A. Al-Abed**, A. Bashaboyina, S. Iyer, et al., "Relation between arterial blood pressure and cerebral blood flow velocity in simulated sleep apnea," in Engineering in Medicine and Biology Society (EMBC), 2012 Annual International Conference of the IEEE, **2012**, pp. 6349-6352.
- **M. A. Al-Abed**, P. Antich, D. E. Watenpaugh, and K. Behbehani, "In vivo characterization of ultrasonic transducers for the detection of airway occlusion in Sleep Disordered Breathing," in Engineering in Medicine and Biology Society, EMBC, 2011 Annual International Conference of the IEEE, **2011**, pp. 7687-7690
- R. Alex, G. Bhave, **M. Al-Abed**, A. Bashaboyina, S. Iyer, D. E. Watenpaugh, et al., "Concurrent variations of cerebral blood flow and arterial blood pressure in simulated sleep apnea," in Engineering in Medicine and Biology Society, EMBC, 2011 Annual International Conference of the IEEE, **2011**, pp. 3209-3212.
- **M. Al-Abed**, P. Antich, D. E. Watenpaugh, and K. Behbehani, "Detection of airway occlusion in simulated obstructive sleep apnea/hypopnea using ultrasound: An in vitro study," in the 32nd Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Buenos Aires, Argentina, **2010**, pp. 284 – 287.
- **M. Al-Abed**, M. Manry, J. R. Burk, E. A. Lucas, and K. Behbehani, "Sleep Disordered Breathing Detection Using Heart Rate Variability and R-Peak Envelope Spectrogram," in the 31st Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Minneapolis, MN, **2009**, pp. 7106-7109.
- **M. Al-Abed**, K. Behbehani, J. R. Burk, E. A. Lucas, and M. Manry, "Cross correlation and scatter plots of the heart rate variability and R-peak Envelope as features in the detection of obstructive sleep apnea," in the 30th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Vancouver, BC, Canada, **2008**, pp. 3488-3491.
- **M. Al-Abed**, K. Behbehani, M. Manry, J. R. Burk, and E. A. Lucas, "A Method to Detect Obstructive Sleep Apnea Using Neural Network Classification of Time-Frequency Plots of the Heart Rate Variability," in the 29th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Lyon, France, **2007**, pp. 6101-6104
- **M. Al-Abed**, K. Behbehani, J. R. Burk, E. A. Lucas, and M. Manry, "A New Method to Detect Obstructive Sleep Apnea Using Fuzzy Classification of Time-Frequency Plots of the Heart Rate Variability," in the 28th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, New York, NY, **2006**, pp. 6493-6496.

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### Patents and Patent Applications

Mohammad Al-Abed, Khosrow Behbehani, and Michael Manry. "Processing and Analyzing Physiological Signals to Detect a Health Condition." U.S. Patent 7,966,061, Jun. 21, 2011.

Mohammad Al-abad, Khosrow Behbehani, Pietro Antich, Donald Watenpaugh, John Burk. "Systems And Methods For Detecting Airway Occlusion", US Patent App. 13/588,819, 2012.

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**Honors and Awards**

- IEEE Regional Exemplary Student Branch Award, Region 8 2020
- The best regional IEEE EMBS Student Chapter or Club Award 2019
- IEEE Regional Exemplary Student Branch Award, Region 8 2019
- Scientific Research and Innovation Fund Distinguished Paper Award 2019
- IEEE Global Student Website Competition, 1<sup>st</sup> place 2017
- Emirates Energy Award (Large Energy Project, Gold Award) 2017
- IEEE Jordan Section Award for Outstanding Student Branch Counselor 2017
- IEEE Regional Exemplary Student Branch Award, Region 8 2017
- IEEE Regional Exemplary Student Branch Award, Region 8 2016
- IEEE Regional Exemplary Student Branch Award, Region 8 2014
- IEEE EMBS Best New Chapter Award 2013
- Alfred and Janet Potvin Outstanding Bioengineering Student Award Feb 2009
- The 1<sup>st</sup> Jordanian All Youth Award of Technology – Knights for Change July 2008
- University Scholar Award April 2007
- Outstanding Student Organization Award for a Professional Honorary or Service Organization, University of Texas – Arlington April 2007

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**Courses Taught**

- Biomedical Instrumentation (1) course and lab
- Medical Electronics
- Medical Imaging
- Digital Medical Image Processing
- Biostatistics
- Ethics and Technical Writing
- Applied Biomedical Signal Processing Using Matlab

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**Hardware Skills**

- Basic and advanced lab equipment: Oscilloscope, frequency analyzer, arbitrary function generator
- FPGA and programmable circuitry
- Electronic circuit design and implementation: operational amplifiers; timing and triggering circuitry; ultrasonic signal preamplifier, turning, and voltage limiters
- National Instruments NiScope High-Speed Digitizer
- PZT ultrasound sensor fabrication, testing, and beam profile analysis
- Physiological signal instrumentation and analysis: NIR; ECG; EEG; EMG; Brain Blood Flow Transcranial Doppler (TCD); SaO<sub>2</sub>; continuous Blood Pressure monitoring; Airflow and exhaled CO<sub>2</sub> monitoring

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**Software Skills**

- MatLab
  - LabVIEW
  - PSpice
  - C/C++
  - MS Windows, MS Office Suit
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<b>Leadership Positions and Talks</b>	<ul style="list-style-type: none"> <li>• PRIS 2017 Speaker and Award Judge</li> <li>• TEDxIrbid Talk</li> <li>• Three-time Amman Technical Tuesdays (AmmanTT) Speaker</li> <li>• President, Biomedical Engineering Student Society (BMESS)</li> <li>• Vice President, Biomedical Engineering Student Society (BMESS)</li> <li>• Graduate Student Senate, Member</li> </ul>	<p><i>August 2017</i></p> <p><i>March 2012</i></p> <p><i>2012-2016</i></p> <p><i>Spring 2007</i></p> <p><i>Fall 2006</i></p> <p><i>2006-2007</i></p>
<b>Professional Affiliations</b>	<p><i>Senior Member, IEEE</i></p> <p><i>Vice Chair, IEEE EMBS Jordan Chapter</i></p> <p><i>Counselor, IEEE Hashemite University Student Branch (SB)</i></p> <p><i>Counselor, AEE Hashemite University Student Chapter</i></p> <p><i>Faculty Advisor, IEEE Hashemite University BMES Student Branch Chapter</i></p> <p><i>Faculty Advisor, IEEE Hashemite University RAS Student Branch Chapter</i></p> <p><i>Student Member, IEEE EMBS</i></p> <p><i>Student Member, BMES</i></p> <p><i>Member, Jordan Engineers Association (JEA)</i></p> <p><i>Member, Jordan Astronomical Society (JAS)</i></p> <p><i>Member, Texas Astronomical Society (TAS)</i></p> <p><i>Member, Association of Energy Engineers (AEE)</i></p>	<p><i>2006- Present</i></p> <p><i>2018-Present</i></p> <p><i>2013- Present</i></p> <p><i>2019- Present</i></p> <p><i>2012- Present</i></p> <p><i>2016- Present</i></p> <p><i>2006- 2011</i></p> <p><i>2009-2011</i></p> <p><i>2003-present</i></p> <p><i>2015-Present</i></p> <p><i>2015-Present</i></p> <p><i>2019-Present</i></p>
<b>Scholarly Reviewer</b>	<p>Reviewer for several international journals:</p> <ul style="list-style-type: none"> <li>• Computers in Biology and Medicine – Elsevier</li> <li>• Medical and Biological Engineering and Computing – Springer</li> <li>• Computer Methods and Programs in Biomedicine – Elsevier</li> <li>• Journal of Biomedical and Health Informatics – IEEE</li> <li>• Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)</li> <li>• Annual International Conference of the IEEE Biomedical Circuits and Systems Conference (BioCAS)</li> <li>• Jordan Journal of Industrial and Mechanical Engineering (JJMIE)</li> </ul>	
<b>Volunteer Work</b>	<ul style="list-style-type: none"> <li>• Hult Prize Judge, National Award-Jordan</li> <li>• Volunteer work with the student body at the Hashemite University</li> <li>• Alternative Spring Break (Catalina Environmental Leadership Program, Catalina Island, CA)</li> <li>• UTA Volunteer Day (The Big Event), Site Leader</li> <li>• UTA Volunteer Day (The Big Event), Site Leader</li> <li>• UTA Volunteer Day (The Big Event)</li> <li>• Alternative Spring Break (New Orleans, LA)</li> </ul>	<p><i>May 2018</i></p> <p><i>2011-present</i></p> <p><i>April 2009</i></p> <p><i>April 2008</i></p> <p><i>March 2008</i></p> <p><i>March 2006</i></p> <p><i>April 2006</i></p>
<b>Extracurricular Activities</b>	<ul style="list-style-type: none"> <li>• Open water SCUBA diving certification</li> <li>• Freefall Parachuting Basic Course</li> </ul>	<p><i>May 2007</i></p> <p><i>June 1998</i></p>