

# Areen Al-Bashir, Ph.D.

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## Education

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- Dec. 2010** PhD in Biomedical Engineering, Wayne State University, Detroit, MI, USA. Thesis: Quantification Of Vascular Parametric Indices Using Dynamic Contrast-Enhanced Magnetic Resonance Imaging.
- Dec. 2006** MS in Biomedical Engineering, Wayne State University, Detroit, MI, USA.
- June 2003** BS in Biomedical Engineering, Jordan University of Science and Technology, Jordan.

## Summary of Work Experience

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- Sept. 2019– present** Acting Chair, Biomedical Engineering Department, Jordan University of Science & Technology (ABET Accredited Program). Irbid, Jordan.
- Oct. 2018– present** Associate Professor, Department of Biomedical Engineering, Jordan University of Science & Technology (ABET Accredited Program). Irbid, Jordan.
- Feb. 2011 – Oct. 2018** Assistant Professor, Department of Biomedical Engineering, Jordan University of Science & Technology (ABET Accredited Program). Irbid, Jordan.
- Jun 2013 – Aug 2013** Visiting Assistant Professor, Department of Electrical Engineering, University of Jordan, Amman, Jordan.
- Jan. 2006 – Dec 2010** Graduate Research Assistance, Harper University Hospital, Detroit, Michigan, USA.
- Jan. 2009 – May 2009** Graduate Teaching Assistance for Magnetic Resonance Imaging course, Wayne State University, Detroit, Michigan, USA.

- Feb. 2005 – Jun. 2005** Teaching Assistance: Jordan University of Science and Technology, Irbid, Jordan: Duties included providing technical and administrative support to electronic Lab students.
- Oct. 2003 – Dec. 2004** Maintenance Engineer, King AbedAllah Hospital, Irbid, Jordan.

## Publications

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### Journals:

- Mohammad A.Al-Abed, **Areen K. Al-Bashir**, Ayman Al-Rawashdeh, Raichel M.Alex, Rong Zhang, Donald E.Watenpaugh and Khosrow Behbehani. Estimation of cerebral blood flow velocity during breath-hold challenge using artificial neural networks. Computers in Biology and Medicine. Dec. 2019, 115. 103508.
- Mohammad A.Al-Abed, **Areen K.Al-Bashir**, Omar A.Saraereh, Farah A.Al-Refaie, Rawan A.Qaqi, Shefa M.Al-Marahlah, and Yasmeen E.Saleh. Computer simulated assessment of radio frequency electromagnetic waves for the detection of obstructive sleep apnea. Aug. 2019, 16. <https://doi.org/10.1016/j.imu.2019.100220>.
- Mohammad Al-Abed , **Areen K. Al-Bashir** , Nathir Obeidat , Sukaina A. Alzyoud, Mahmoud Abu Khalaf, Mohammad Obeidat, Saif AlDeen AlRyalat , Haya Abu Khadra, Mais Jalamneh, Rania Al-Bluwi, Wafaa Al-Omari, Quantifying Long QT Syndrome in Obese Sleep Apnea Patients Undergoing Roux-en-Y Gastric Bypass Surgery. 2019 41st Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC); DOI: [10.1109/EMBC.2019.8856727](https://doi.org/10.1109/EMBC.2019.8856727).
- **Areen K. Al-Bashir**, Hala K. Amari, Fadi M. Rousan, and Rami A. Jahmani. Automatic Beta Angle Measurements in Ultrasonic Developmental Dysplasia of the Hip. International Conference on Digital Image & Signal Processing "DISP '19", Oxford, United Kingdom ISBN: 978-1-912532-09-4.
- **Areen K Al-Bashir**, Ruba E Khnouf, Enas W Abdulhay, Design, implementation, and evaluation of an introductory biomedical engineering course. Biomedical Research Feb. 2019; 30. ISSN: 0970-938X (Print) | 0976-1683 (Electronic).
- **Areen K. Al-Bashir**, Mohammad A. Al-Abed, Hala K. Amari, Fadi M. Al-Rousan, Omar MK. Bashmaf, Enas W. AbdulHay, Rabah M. Al abdi

and Ahmad K. Al-Basheer. Computer-Based Cobb Angle Measurement using Deflection Points in Adolescence Idiopathic Scoliosis from Radiographic Images. *Neural Computing and Applications*. June 2018. **31**, pages1547–1561(2019). DOI: 10.1007/s00521-018-3614-y.

- Rabah M. Al abdi, Ahmad E. Alhitary, Enas W. AbdulHay and **Areen K. Al-bashir**. Objective detection of chronic stress using physiological parameters. *Medical & Biological Engineering & Computing*. Jun 2018. ISSN: 1741-0444.
- **Al-Bashir, Areen K.**; Al-Abed, Mohammad; Amari, Hala K.; Abdulhay, Enas W.; AlRousan, Fadi M.; Jahmani, Rami A. A Clinical Based Semi-Automatic Algorithm for Developmental Dysplasia of the Hip Assessments in Ultrasound Images. / *Journal of Medical Imaging and Health Informatics*. Dec 2017. 7(8):1789-1797.
- Enas Abdulhay, Maha Alafeef, Arwa Abdelhay and **Areen Al-Bashir**. Classification of Normal, Ictal and Inter-ictal EEG via Direct Quadrature and Random Forest Tree. *Journal of Medical and Biological Engineering*. Dec 2017. 37(6): 843-857.
- Azam Niroomand-Rad, Slavik Tabakov, Ibrahim Duhaini, Rabi Mahdavi, Behrouz Rasuli, Nabaa Naji, Muthana Al-Ghazi, **Areen Al-Bashir**, Ali H. Al-Akhras, Meshar Al-Nuaimi, Zakiya Salem Al-Rahbi, Ismail and others. Status of Medical Physics Education, Training and Research in Middle East. *Medical Physics International Journal*. Dec 2017. 5(2): 133-152.
- Enas Abdulhay, Ruba Khnouf, Shireen Haddad and **Areen Al Bashir**. Improvement of medical content in the curriculum of biomedical engineering based on assessment of students outcomes, *BMC Medical Education*, Aug 2017. 17(1).
- **Areen K. Al-Bashir**, Mohammad Al-Abed, Fayez M. Abu Sharkh, Mohamed N. Kordeya, AND Fadi M. Rousan Algorithm for automatic angles measurement and screening for Developmental Dysplasia of the Hip (DDH), 2015 37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC); 6386 – 6389.
- **Areen K. Al-Bashir**, Gilda G. Hillman, Meng Li, and E. Mark Haacke New DCE-MRI Parametric Maps to Quantify the Vascular Changes Induced by Sunitinib Treatment in Renal Carcinoma Tumors. 2014 Middle East Conference on Biomedical Engineering (MECBME).

- Mamoon Al-Omari and **Areen Al-Bashir**. Internal jugular vein valve morphology in the patients with chronic cerebrospinal venous insufficiency (CCSVI); angiographic findings and schematic demonstrations. Rev Recent Clin Trials, 2012 May; 7(2):83-7
- Gilda Hillman, Vinita Singh-Gupta, **Areen K Al-Bashir** , Christopher K Yunker, Michael C Joiner , Fazlul H Sarkar, Judith Abrams and E. Mark Haacke. Monitoring Sunitinib-Induced Vascular Effects to Optimize Radiotherapy Combined with Soy Isoflavones in Murine Xenograft Tumor. Trans Oncol, 2011, 4(2).
- Gilda Hillman, Vinita Singh-Gupta, **Areen Al-Bashir**, Hao Zhang, Christopher Yunker, Judith Abrams and Mark E. Haacke. Dynamic Contrast-Enhanced Magnetic Resonance Imaging of Sunitinib-Induced Vascular Changes to Schedule Chemotherapy in Renal Cell Carcinoma Xenograft Tumors. Trans Oncol, 2010 3(5): 293–306.
- Gilda G. Hillman, Vinita Singh-Gupta, Hao Zhang, **Areen K. Al-Bashir**, and others. Dynamic Contrast Enhanced Magnetic Resonance Imaging of Vascular Changes Induced by Sunitib, an Anti-Angiogenic Drug, in Murine Kidney Tumors. Neoplasia, 2009. 11(9): p. 910-20
- E. Mark Haacke, Cristina L. Filletti, Ramtilak Gattu, Carlo Ciulla, **Areen Al-Bashir** and others. New algorithm for quantifying vascular changes in dynamic contrast-enhanced MRI independent of absolute T1 values. MRM, 2007; 58: 463-472.

### **Abstracts:**

- **Areen K. Al-Bashir**, Mohammad A. Al-Abed, Hala K. Amari, Fadi M. Al-Rousan, Omar MK. Bashmaf and Ahmad K. Al-Basheer. Computer-Based Cobb Angle Measurement Using Deflection Points in Adolescence Idiopathic Scoliosis From Radiographic Images. The 60th Annual Meeting & Exhibition of AAPM, Nashville, TN, 2018.
- **Al-Bashir, Areen K.**; Al-Abed, Mohammad; Amari, Hala K.; Abdulhay, Enas W.; AlRousan, Fadi M.; Jahmani, Rami A. Semi-Automatic Algorithm for Alpha Angle Measurement in Ultrasound Developmental Dysplasia of the Hip (DDH) Images. International Conference on Advances in Biotechnology Dubai, UAE, July , 2017.
- M. Li, **A. K. Al.Bashir**, Y. Yu, and E. M. Haacke. Tissue Similarity Map of High Resolution Perfusion Weighted MR Imaging of the Brain. ISMRM 2010.

- **A. Al.Bashir**, G. Hillman, M. Li and E. M. Haacke. Introducing New DCE Parametric Maps to Quantify Vascular Changes Induced by the Anti-Angiogenic Drug Sunitinib. ISMRM 2010.
- Gilda Hillman, Vinita Singh-Gupta, **Areen Al-Bashir**, Hao Zhang, Christopher Yunker, Judith Abrams and Mark E. Haacke. Imaging sunitinib-induced vascular changes by DCE-MRI to schedule chemotherapy in renal cell carcinoma. AACR 101st Annual Meeting, Washington DC, 2010.
- **A. K. Al.Bashir**, G. Hillman and E. M. Haacke. DCE-MRI Evaluation of the Effect of the Antiangiogenic Drug Sunitinib on Murine Renal Cell Carcinoma. WSU, Detroit 2009.

## Grants, Projects and Training:

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### A. Grants:

- Cerebral Blood Flow variations in Patients with Chronic Cerebrospinal Venous Insufficiency (Dec 2012). Jordan University of Science and Technology. Role: PI.
- Automation of the Assessment Methods Used to Evaluate Human Skeletal System Deformities (Oct. 2016). Jordan University of Science and Technology. Role: PI.
- Automatic algorithm for RBC's counting and analysis (submitted Jun. 2018) . Jordan University of Science and Technology. Role: PI. Approved by Faculty Research committee.

**B. A New Collimator Design for Small Animal Irradiator:** Accurate and local radiation dose delivery can improve the understanding of radiation effects by isolating confounding factors of variation in radiation delivery. In this study, we are designing a new method of delivering radiation with available Cs small animal irradiator which allows researchers to mimic therapeutic radiation exposure to specific area of interest. Under progress.

### C. Training in MRI Techniques

- **DCE MRI:** Dynamic Contrast-Enhanced Magnetic Resonance Imaging (DCE-MRI) is a MR sequence used for assessment of the anti-angiogenic cancer-tumor study treatments, to characterize microvasculature of tumors and quantify tumor blood flow changes in patients that received antivasular and anti-angiogenic cancer drug treatments.
- **PW-MRI:** Perfusion Weighted Magnetic Resonance Imaging (PW-MRI) is a MR sequence for imaging the physiology of the microcirculation.

- **SW-MRI:** Susceptibility Weighted Magnetic Resonance Imaging can evaluate and exploits the magnetic properties of blood, iron and other tissues.
- D. Tensor Based Image Registration:** introduced a new algorithm for registering brain images and constitutes an improved variant to the classic tensor-based moment-of-inertia rigid body method.
- E. Computer Based ECG System:** Computer-based instrumentation is the methodology of using software Programming and PC-based data acquisition hardware to build application-specific instrumentation solutions.

#### **Leading and community services activities:**

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- Collaborator in a proposal targeting the foundation of Master degrees of Biomedical Engineering at Jordan University of Science and Technology (2016).
- Establishing the new 'Laboratory of Engineering Tools' in Jordan University of Science and Technology. Dr. Areen Al-Bashir was in charge of preparing and developing several computer-based programs, activities and manuals that help students understand, analyze and implement different concepts of Engineering (2015).
- Revising the "Electrical Circuit Lab for Biomedical Engineering" in terms of experiment and manual for Biomedical Engineering Department at Jordan University of Science and Technology (2015)
- Member of the BME department curriculum committee in charge of study plan improvement. The new study plan has been approved by the ABET/EAC in USA (2013-2014).
- Volunteering at Injaz organization in the Entrepreneurship and Employment Program (EEP) that targets students in universities and colleges throughout Jordan through the Enterprise Development Program (EDP) to promote a culture of entrepreneurship and build the capacity of young Jordanian men and women as innovators and skilled entrepreneurs (2013-2014).
- Establishing the IEEE-EMBs students' chapter of Biomedical Engineering Department at Jordan University of Science and Technology (2015).
- Nominated by the college of Engineering at Jordan University of Science and Technology for Nansen Refugee award in 2015. The UNHCR Nansen Refugee Award honours individuals, groups and

organizations who go above and beyond the call of duty to protect refugees, displaced and stateless people.

- Organizing and leading some refugee camps trips for the Biomedical Engineering students at Jordan University of Science and Technology during 2012-2014. These trips include Humanitarian aid in terms of collecting supplies for the refugees, gifts and activities for the camps children.
- Advising the Voluntary Work student Club at the deanship of Student Affairs at Jordan University of Science and Technology
- Organizing Orphans two Ramadan Iftars with the Electrical Engineering students at the University of Jordan, Amman during summer 2013.
- Establishing the "House of Development and Empowerment Charity" and participating in all its activities. Our mission was to empower individuals and families to achieve independence and find a way to live. March 2016-Sept 2017.

### **Key Courses Taught**

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- BIOMEDICAL INSTRUMENTATION LAB (2)
- BIOMEDICAL INSTRUMENTATION LAB (1)
- BIOMEDICAL INSTRUMENTATION
- COMMUNICATION SKILLS FOR ENGINEERS
- DIGITAL IMAGE PROCESSING
- DIGITAL LOGIC DESIGN AND COMPUTER ARCHITECTURE LAB
- ELECTRIC CIRCUIT ANALYSIS
- ELECTRIC CIRCUITS LAB
- ELECTRICAL CIRCUITS LAB
- ENGINEERING TRAINING
- INTRODUCTION TO BIOMEDICAL ENGINEERING
- MAGNETIC RESONANCE IMAGING
- MEDICAL IMAGING SYSTEMS
- MEDICAL ELECTRONICS LAB
- PHYSIOLOGICAL FLUID MECHANICS
- SEMINAR IN BIOMEDICAL ENGINEERING
- STATISTICS FOR BIOMEDICAL ENGINEERS
- TOOLS FOR BIOMEDICAL ENGINEERS

### **Selected Senior Graduation Projects:**

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- Implementation of PWI.

- Improved Tensor-Based Registration Technique for Image Guided Surgery System
- Scoliosis
- Improved Tensor-Based registration Technique for Image Guided Surgery System
- x-ray ddh
- Sleep apnea
- Ultrasound image enhancing for liver cancer detection
- Medical filing
- Effect of music on EEG signal
- lower limb deformity
- Planter pressure distribution
- Image Quantification for a three-dimensional paper based microfluidic device
- Eye Tracking Technology and Its Biomedical Applications”
- Tumor Segmentation based on edge detection methods
- Computer-Aided System for Red Blood Cells Classification and counting.
- Muscle Examination.

### **Committee Memberships:**

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Served as a member of various scientific and educational councils and committees:

- Accreditations and quality assurance for higher education committee.
- BME department council.
- BME department representative at the college of engineering council.
- BME department scientific research committee BME department graduate studies committee
- BME department curriculum committee.
- BME department ABET accreditation committee
- BME department practical training committee
- BME department social committee
- BME department tendering committee
- Major member in the committee of monitoring for students' election process in the BME department (2012).
- Member at the Institute of Electrical and Electronics Engineers (IEEE).
- Member at the International Society for Magnetic Resonance in Medicine (ISMRM).
- Member at the Jordan Engineers Association.



## References

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Available upon request.