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 The Hashemite University.
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Research Interest

Biofluids, Biomechanics, Micro-scale modeling of red blood cells and platelets, flow in carotid artery, Biomaterials, and Medical waste management.

EDUCATION

The University of Iowa (UI), Iowa city, IA, USA *May, 2007*
 Doctor of Philosophy in Biomedical Engineering.
Jordan University of science and Technology (JUST), Jordan *Jan, 2001*
 Master of Science in Mechanical Engineering.
Jordan University of Science and Technology, Jordan *Jun, 1998*
 Bachelor of Science in Mechanical Engineering.

RESEARCH EXPERIENCE

The Hashemite University, Biomedical Engineering Department (Jordan) *2007-present*

- Developing and applying 2D and 3D of flow in carotid artery.
- Developing and applying 2D and 3D of flow in AAA.
- Developing and applying 2D and 3D micro-scale models for the deformation and motion of a single RBC.
- Developing a mathematical model to describe the physiological nature of blood cells.
- Developing and applying a micro-scale model of a cloud of RBCs with (a) RBC-RBC interaction, (b) RBC-platelet interaction, and (c) RBC-wall interaction.
- Developing a damage model that can describe the deconstruction of the RBCs and platelet activation.
- Developing and applying a multi-scale model that can match micro and macro computations.
- Extend the computations for a model that present the flow of the RBCs and platelets in specific geometries such as constricting and diverging regions representative of small gap widths present in implants such as mechanical heart valves.
- Establishing a data base that can describe the medical waste in Jordan.
- Studying the impact of medical waste in Jordan on environment and water.

The University of Iowa, Biomedical Engineering Department (USA) *2007-2013*

Adjunct instructor

The University of Iowa, IIHR- Hydrosience & Engineering (USA)

Visiting Research Scholar

- Developing and applying 2D and 3D micro-scale models for the deformation and motion of a single RBC.
- Developing and applying a micro-scale model of a cloud of RBCs with (a) RBC-RBC interaction, (b) RBC-platelet interaction, and (c) RBC-wall interaction.
- Developing a damage model of that can describe the deconstruction of the RBCs and platelet activation.
- Developing and applying a multi-scale model that can match micro and macro computations.
- Extend the computations for a model that present the flow of the RBCs and platelets in specific geometries such as constricting and diverging regions representative of small gap widths present in implants such as mechanical heart valves.

The University of Iowa, Biomedical Engineering Department (USA)

Research Assistant

Cardiovascular Research Laboratory and IIHR Laboratory

2003-Jul 2007

- Developed a CFD model that has been used to simulate the dynamics of the moving red blood cells and platelets in the blood plasma and the interaction of these cells with each other and with blood plasma.
- Examined the effect of red blood cells on platelet transport in high-constriction flow regions and investigated the mechanisms underlying this effect.
- Calculated the effect of different hematocrit levels on the fluctuating shear stress-time history on platelets as they pass through high-constriction flow regions and investigated the influence of red blood cells (RBCs) on shear stress history experienced by platelets.
- Examined the sensitivity of shear-induced platelet activation measures to the presence of red blood cells in the flow field, as measured by the hematocrit value

ADMINISTRATIVE EXPERIENCE

- Director of center for studies, consultation, and continuing education, the Hashemite University.** Sep 2014 - present
- BME department chair, Biomedical Engineering Department, The Hashemite University** Sep 2012 – sep 2014
- BME department chair, Biomedical Engineering Department, The Hashemite University** Sep 2008 – Sep 2009

TEACHING EXPERIENCE

- Associate Professor, Biomedical Engineering Department, The Hashemite University** oct.2013–present
- Assistant Professor, Biomedical Engineering Department, The Hashemite University** 2007- oct.2013
 - Biomechanics I and II.
 - Biomaterials.
 - Biofluids.
 - Engineering mechanics.
 - Cardiovascular mechanics.
 - Biomechanics and kinesiology.
 - Statics.
 - Rehabilitation engineering.
 - Transducers lab.
 - Ethics and technical writing
- Adjunct instructor, Biomedical Engineering Department, The University of Iowa.** 2007-2013
 - statics
- Teaching Assistant, biomedical Engineering Department, The University of Iowa** 2004-2007
 - Statics
 - Cardiovascular mechanics.
 - Biofluids.
- Teaching Assistant, biomedical Engineering Department, Jordan University of science and technology** 1998-2000
 - Engineering Drawing
 - Thermal implants.
 - Fluid dynamics

OTHER EXPERIENCE

- *Mechanical engineer, Jordan telecom* 1999-2003
- *Mechanical engineer, private sector, Jordan* 1998-1999

PROFESSIONAL SERVICES

- Reviewer for international journals
- Organizer of several conferences
- Scientific committee of several conferences
- Since 2007: Research collaboration with IIHR Lab in Iowa city, Iowa, USA, with Prof. K. B. Chandran, Prof. UdayKumar, and Dt. Sarah Vigmostad.
- 2012: Organizer of the Third International Conference of Energy, Water, and Environment.

THESIS

Micro-scale Dynamic Simulation of Erythrocyte-Platelet Interaction

SKILLS

- *Programming skills:*
FORTRAN, C, C++, MATLAB.
- *FEM packages:*
ANSYS, FLUENT, COSMOS.

MEMBERSHIP and AWARDS

- Member of JEA (Jordanian Engineering Association)
- Research Assistance award, the University of Iowa years: 2004, 2005, 2006, and 2007.
- University of Iowa, Teacher Assistance scholarship 2003-2007
- Hashemite University, scholarship for distinctive students 2003-2007.
- Grad Assistant Tuition Award, University of Iowa 2004, 2005, and 2006
- Ided Chair Funds/Engineering, Iowa state 2006.

RESEARCH GRANTS

- HU (T. AlMomani, PI): Shear Induced thrombus formation in the cardiovascular system. Dec. 2012, \$ 160,000 for 2 years.
- SRF (T. AlMomani. Co. I.): Characterization of Calcium Salts as Delivery Vehicles for Insulin in Osseous Repair. Nov. 1 2009, \$ 35,000 for 2 years.
- HU (T. AlMomani, PI): Influence of red blood cells and unsteady flow on platelet activation. June 6th 2008, \$ 3000 for 3 years.

PUBLICATIONS

Conferences

- **AlMomnai T.**, "Automated Obstructive Sleep Apnea Screening Device Using Thermal Sensor", proceedings of *International Conference on Bio-engineering for Smart Technologies (BioSMART 2016)*", Dubai (UAE), 2016
- **Almomani T.**, Vigmostad S., UdayKumar S, Krishnan B. C, " Modeling of red blood cell dynamics using fluid structure interface (FSI) technique", *Proceedings of the ASME 2010 Summer Bioengineering Conference*. FL, USA, June, 2010.
- UdayKumar S., **AlMomani T.**, Krishnan S., Vigmostad S., "Fluid-solid interactions in heart valve operation - multi-scale and multimaterial simulations", *9th US Congress in Computational Mechanics*, California, USA July 2007.
- **AlMomani T.**, Govindarajan V., UdayKumar S. H, Marshall J., Krishnan B. C., " Micro-scale dynamic simulation of erythrocyte-platelet interaction", *ASME Fall Conference*, USA Sep. 2007.
- Govindarajan V., **AlMomani T.**, UdayKumar S. H, Marshall J., Krishnan B. C., "Micro-scale RBC/platelet dynamics in the hinge region of a mechanical heart valve", *ASME Fall Conference*, USA Sep. 2007.
- Chesnutt, J.K.W., Marshall, J.S., and **AlMomani, T.**, "A Discrete-Element Approach for Blood Cell Adhesion", American Physical Society 59th Annual Meeting of the Division of Fluid Dynamics, USA November 2006.
- **AlMomani T.**, Marshall J., Krishnan B. C, " Effect of Red Blood Cells on Shear-induced Platelet Activation – A Micro-scale Computational Simulation", *World Congress of Biomechanics*, Germany, Aug. 2006.
- **AlMomani T.**, Marshall J., Krishnan B. C, "Influence of Red Blood Cell on Shear-induced Platelet Activation in Flow Through Mechanical Heart Valves", *The Iowa Academy of Science Annual Meeting*, USA April 2006.

Journal papers

- **AlMomani T.**, "characterization of blood hemodynamic in carotid artery with different bifurcation angle", *In preparation*.
- **AlMomani T.**, "influence of red blood cell shape on platelet scattering toward the vessel wall", *International Journal of Biomedical Engineering and Technology*, Volume 21, Issue 3, pp 264–278, 2016.
- Bdour A., Tarawneh Z., **AlMomani T.**, El-Mashaleh M., "Analysis of Hospital Staff Exposure Risks and Awareness about Poor Medical Waste Management - A Case study of the Tabuk Regional Healthcare System - Saudi Arabia", *J. Commun. Dis.* 2015; 47(2): 1-13
- Bani Hani S., Rabczuk T., **AlMomani T.**, "POD for Real-Time Simulation of Hyperelastic Soft Biological Tissue Using the Point Collocation Method of Finite Spheres", *Mathematical Problems in Engineering*, Volume 2013, Article ID 386501.
- **AlMomani T.**, AlZube L., Bataineh O., "Assessment of Medical Wastes Management Protocols in Jordanian Healthcare Institutions". *International Journal of Environment and Waste Management*, 11 (3): 423 – 434, 2013.
- Alzube L., **AlMomani T.**, Bataineh O., Tahtamouni L., "In vitro Characterization of Calcium Salts as Delivery Vehicles for Insulin", *Journal of Biomimetics, Biomaterials, and Tissue Engineering*, 17 : 53- 58, 2013.
- **AlMomani T.**, Vigmostad S., Chivukula K., Al-zube L., Smadi O., BaniHani S, "Red Blood Cell Flow in the Cardiovascular System: a Fluid Dynamics Perspective". *Critical reviews in biomedical engineering*, 40(5): 427–440 (2012)
- **AlMomani T.**, Vigmostad S., AlZube L., "A Sharp-Interface Fluid-Structure Interaction Algorithm for Modeling Red Blood Cells". *JJMIE*, 6 (2): 193-198, April 2012.
- AlZube L. AlTamimi A., **AlMomani T.**, AlKaralah A, AlZwahreh M., "Modeling and Simulating Human Arm Movement using a 2 Dimensional 3 Segments Coupled Pendulum System", *World Academy of Science, Engineering and Technology*, 7: 1372 – 1377. 2012
- **AlMomani T.**, UdayKumar S. H, Marshall J., Krishnan B. C, "Micro-Scale Dynamics of Erythrocytes-Platelet Interaction In blood flow", *Annals of Biomedical Engineering*, 36(6):905-920, 2008.
- **AlMomani T.**, Marshall J., Krishnan B. C, "Effect of red blood cells on shear-induced platelet activation: a micro-scale computational stimulation", *Journal of Biomechanics*, Volume 39, PP. S296, Supplement 1, 2006.

REFERENCE LIST

Available upon request