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EDUCATION

PH.D. STUDENT, EARLY STAGE RESEARCHER 2018
BIOMECHANICS SECTION, KU LEUVEN LEUVEN, BELGIUM

- **Major:** Computational Biomechanics
- **Supervisor:** Prof. Liesbet Geris

MASTER OF SCIENCE IN BIOMEDICAL ENGINEERING 2011 – 2014
DEPARTMENT OF LIFE SCIENCE ENGINEERING, UNIVERSITY OF TEHRAN TEHRAN, IRAN

- **Major:** Biomaterials
- **Thesis:** Computational and Experimental Analysis of Dynamics of Urine Flow in the Lower Urinary System in the Physiological and Pathological Conditions using FSI Method
- **Supervisor:** Prof. Bahman Vahidi

BACHELOR OF SCIENCE IN MATERIALS SCIENCE AND ENGINEERING 2006 – 2011
DEPARTMENT OF MATERIALS ENGINEERING, AMIRKABIR UNIVERSITY TEHRAN, IRAN

- **Major:** Industrial Metallurgy
- **Thesis:** Prediction of Microshrinkage Porosities using the Permeability Parameter Modeled with Artificial Neural Networks in Al-6%Si Alloy by Finite Volume Method
- **Supervisor:** Prof. S.M.H. Mirbagheri

RESEARCH INTERESTS

- Scientific Computing
- Computational Engineering
- GPU Programming and High-Performance Computing
- Machine Learning and Computational Intelligence
- Computational Biomechanics
- Computational Materials Science

RESEARCH PROJECTS

COMPUTATIONAL FLUID DYNAMICS

- Development on OpenLB CFD Code in order to Modify the Shan-Chen Approach for Multi-phase Fluid Simulation, *Amirkabir University of Technology* 2013–2017
- Development of Coupling Simulation Software Packages to Link Multiphysics CFD Models and AI using C++, C# and Python, *Amirkabir University of Technology* 2010–2011
- Development of In-house CFD Codes using C++ for Simulating Fluid Flow and Heat Transfer in Metal Casting Process, *Amirkabir University of Technology* 2008–2011

COMPUTATIONAL BIOMECHANICS

- Implementation of Fluid-Structure Interactions Models to Simulate Fluid Dynamics of Human Body Fluids, *University of Tehran* 2012–2014

COMPUTATIONAL MATERIALS SCIENCE

- Development of Dendrite and Microstructure Growth Software in C# and C++ to Simulate the Solidification Process of Metals, *Amirkabir University of Technology* 2009–2011
- Development of Heat Transfer Simulation Codes in MATLAB in order to Model Heat Treatment in Metals, *Amirkabir University of Technology* 2008

MACHINE LEARNING AND COMPUTATIONAL INTELLIGENCE

- Implementation of Machine Learning Models for Anomaly Detection of EEG and ECG signals, *KU Leuven & Imec* 2018
- Implementation of ANN Models in MATLAB to Investigate Complex Parameters of Urology Diseases, *University of Tehran* 2013–2014
- Implementation of ANN Models in C# and MATLAB to Investigate Relations between Porous Media Parameters and Permeability, *Amirkabir University of Technology* 2010–2011

PUBLICATIONS

PUBLICATIONS IN REFEREED JOURNALS

1. **M. Barzegari**, H. Bayani, S. M. H. Mirbagheri, H. Shetabivash, “[Multiphase Aluminum A356 Foam Formation Process Simulation Using Lattice Boltzmann Method](#)”, *Journal of Materials Research and Technology* (2018), DOI:10.1016/j.jmrt.2018.03.010
2. H. Bayani, S. M. H. Mirbagheri, **M. Barzegari**, and S. Firoozi, “[Simulation of Unconstrained Solidification of A356 Aluminium Alloy on Distribution of Micro/Macro Shrinkage](#)”, *Journal of Materials Research and Technology*, Vol. 3, No. 1, pp. 55-70, 2014

PUBLICATIONS AS BOOK CHAPTERS

1. S. M. H. Mirbagheri, H. Bayani, **M. Barzegari**, and S. Firoozi, “[Simulation of Liquid Flow Permeability for Dendritic Structures during Solidification Process](#)”, *Computational Fluid Dynamics Technologies and Applications*, Intec, 2011

PREPRINTS AND SUBMITTED PAPERS

1. **M. Barzegari**, H. Bayani, S. M. H. Mirbagheri, “[A Criterion for Bubble Merging in Liquid Metal: Computational and Experimental Study](#)”, arXiv Preprint
2. **M. Barzegari**, B. Vahidi, M. R. Safarinejad, “[A Clinical and Finite Elements Study of Stress Urinary Incontinence in Women Using Fluid-Structure Interactions](#)”, arXiv Preprint
3. **M. Barzegari**, B. Vahidi, M. R. Safarinejad, M. Hashemipour “[Pathological Analysis of Stress Urinary Incontinence in Females using Artificial Neural Networks](#)”, arXiv Preprint

PUBLICATIONS IN REFEREED JOURNALS (IN PERSIAN)

1. **M. Barzegari**, B. Vahidi, M. R. Safarinejad, “[Investigating Stress Urinary Incontinence in Women Using Computational Methods and Clinical Data](#)”, *Journal of Modares Mechanical Engineering*, Vol. 17, No. 5, pp. 417-427, 2017
2. S. M. H. Mirbagheri, H. Bayani, **M. Barzegari**, “[Micro Shrinkages Simulation in Mushy Zone by Permeability Calculation](#)”, *Journal of Iranian Foundrymen's Society*, Vol. 102, pp. 42-50, 2013
3. **M. Barzegari**, S. M. H. Mirbagheri, “[Assessment of the Slope and Cross-Section of In-Gate on the Pressure and Flow Pattern Using Finite Volume Method](#)”, *Journal of Metallurgical and Materials Engineering*, Vol. 22, No. 2, pp. 21-36, 2011

PUBLICATIONS IN REFEREED CONFERENCE PROCEEDINGS

1. **M. Barzegari**, B. Vahidi, M. R. Safarinejad, “[Computational Simulation of Stress Urinary Incontinence using Fluid-Structure Interaction Analysis](#)”, *25th International Conference on Mechanical Engineering*, Tehran, Iran, 2017 [Persian]
2. **M. Barzegari**, H. Bayani, S. M. H. Mirbagheri, “[Computational and Experimental Investigation of Air Bubbles Coalescence in Metal Melts](#)”, *25th International Conference on Mechanical Engineering*, Tehran, Iran, 2017 [Persian]
3. S. Gholami, A. Danayi, A. Rezaee, **M. Barzegari**, “[Embedded Systems and the Challenge of Complex Computing in Internet of Things](#)”, *1st International Conference on Internet of Things, Applications and Infrastructure*, Isfahan, Iran, 2017 [Persian]

WORK EXPERIENCES

Selected Projects (Among 20 More) in 15 Years of Professional Software Development and Computer Programming Experiences:

INTERNET OF THINGS & EMBEDDED SYSTEMS

- Design and Implementation of Smart Home Solutions based on IoT and Cloud Computing Paradigms, Freelance Projects 2016–2017
- Design and Implementation of Embedded Systems and Embedded Linux Programs using C, C++, Python and GNU Toolchains, Amirkabir University of Technology 2016–2017

WEB & MOBILE APPLICATIONS

- Implementation of Resources and Documents Management Software for Iran Red Crescent Society using C# and .NET Web Technologies 2015–2016
- Implementation of Online Shopping System for Parhoon Koosha Co. using PHP 2016
- Implementation of Android-based Enterprise Apps using Java and Xamarin Technologies, Freelance Projects 2015–2016
- Development and Optimization of the User Interface of Comprehensive Medical Instruments Software, Avizheh IT Co. 2014
- Development of Commission Management Software for Tehran Municipality using .NET Web Technologies 2011

DESKTOP & ENTERPRISE APPLICATIONS

- Development of Estate Profiling Software using C#, Venus IT Co. 2013
- Development of Tehran Districts Profiling and Reporting Software for Tehran Municipality using C# and .NET Technologies 2012
- Development of Office and Workflow Automation Software for Iran Tube and Machine Manufacturing Corporation using C# and .NET Technologies, Avizheh IT Co. 2010–2011
- Development of Project Control and Operational Automation Software for Iran Railway Corporation using VB and .NET Technologies, Avizheh IT Co. 2008–2011.
- Development of Workflow Management Software for Parhoon Koosha Co. using C# and .NET Technologies 2006

SCIENTIFIC APPLICATIONS

- Implementation of SUTCast Simulation Software Code in MATLAB (Fluid Flow and Heat Transfer), Razi Research Center of Applied Science 2015
- Implementation of ANN Model for Optimization of Rolling Parameters in Mobarakeh Steel Manufacturing Co. using MATLAB 2014
- Development of Mathematical Computation and Function Plotting Software using C# (Awarded as 2nd Place in Khwarizmi Young Award) 2004
- Development of Robot Control Software using VB, Iran Students' Foundation 2003

TEACHING EXPERIENCES

UNOFFICIAL TEACHING

- Teaching Metal Casting Simulation to Mechanical Engineering Students
- Teaching Scientific Computing Concepts to Biomedical Engineering Students
- Teaching Advanced Programming to Electrical Engineering Students
- Teaching Computer Basics and Mathematics to Kids

WORKSHOPS

- “Towards Embedded Systems, Motivational Role of Free Software”, TEHRAN SOFTWARE FREEDOM DAY FESTIVAL, SHARIF UNIVERSITY OF TECHNOLOGY 2016
- “An Introduction to \LaTeX for Thesis Typesetting”, UNIVERSITY OF TEHRAN 2013

AWARDS

- Awarded Researcher of Department of Materials Science and Engineering, Amirkabir University of Technology, 2011
- 2nd Place in Khwarizmi Young Award in Tehran Province in the field of Mathematics (Project Title: Mathematical Computation and Function Plotting Software), 2004

TECHNICAL SKILLS

- **Operating Systems**
Microsoft Windows (Client & Server), GNU/Linux (Desktop & Embedded)
- **Programming Languages & Frameworks**
C, C++, C#, Python, Java, Visual Basic, T-SQL, ActionScript, .NET and .NET Core, Android App Development, Xamarin, Universal Windows Platform (UWP), Arduino
- **Scientific Computing**
MATLAB & GNU Octave, Maple, CUDA
- **Databases**
Microsoft SQL Server, MySQL (MariaDB)
- **Web Development**
HTML, CSS, JavaScript, PHP, ASP.NET, Django
- **Engineering Software Packages**
SolidWorks, ANSYS (Mechanical, Fluent, Explicit Dynamics & AUTODYN), ProCAST, MSC Patran, MD ADAMS, COMSOL
- **Other**
 \LaTeX , Machine Learning Libraries, Docker, Git

PERSONAL DETAILS

- **Date of Birth:** February 25th, 1988
- **Nationality:** Iranian
- **Languages Known:**
 - Persian: Native
 - English: Fluent
- **Extracurricular Activities:**
 - Amateur Guitar Playing (Bass, Acoustic, Electric)

- Playing Volleyball & Chess
- Swimming & Biking
- Playing Computer & Mobile Games
- Reading Science, Music, and History Books

REFERENCES

1. Prof. Liesbet Geris:

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2. Prof. S. M. H. Mirbagheri:

📍 Amirkabir University of Technology, Tehran, Iran

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3. Prof. Bahman Vahidi:

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