MOJTABA BARZEGARI

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Education

Ph.D. Student, Early Stage Researcher 2018 – 2019
Biomechanics Section, KU Leuven Leuven, Belgium

- **Major:** Computational Biomechanics
- **Project Title:** Computational Multiscale Modeling of Biodegradation Behavior of Personalized Printed Implants
- **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 Multiphase 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

- Mathematical Modeling and Numerical Simulation of Biodegradation Behavior of Printed Implants, *KU Leuven* 2018–2019
- 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 Signal Processing and Anomaly Detection of EEG and ECG Signals, *KU Leuven & Imec* 2018–2019
- 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, FreeFem++
- **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