

# Arman Hajizadeh

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## Education

**Sharif University of Technology**, Tehran

*MEng in Mechanical Engineering*

September 2019 - August 2022

**Amirkabir University of Technology**, Tehran

*BEng in Manufacturing and Production Engineering*

September 2012 - August 2019

## Publications

- **Prediction of Aqueous Solubility of Drug Molecules by Embedding Spatial Conformers Using Graph Neural Networks (GNN)**  
*[2022 29th National and 7th International Iranian Conference on Biomedical Engineering (ICBME)]*
- **Fabrication and Enhancement of an Antibacterial Chitosan-coated Allantoin-loaded Skin Wound Dressing Using NaCMC/SA Hydrogels**  
*[International Journal of Biological Macromolecules, Volume 253, Part 4, 31 December 2023, 127051]*

## Awards

- Membership in Iran's National Elites Foundation( ?) 2023
- Recipient of a grant from the National Institutes of Medical Research Development of Iran for Prediction of Aqueous solubility of Drugs with GNN 2023
- Invention of a Real-time PCR (Patent Pending) 2022
- Granted for a Real-time PCR Device Production funded by Iran National Innovation Fund 2020
- Ranked 56th amongst 22000 participants in the annual national entrance exam for graduate student selection 2019
- Ranked 39th amongst 26000 participants in the annual national entrance exam for graduate student selection 2017
- Ranked 986th amongst 260055 participants in the annual national entrance exam for undergrad. Student selection 2012
- Selected for National Organization for Development of Exceptional Talents, for Higher Secondary Education 2008
- Selected for National Organization for Development of Exceptional Talents, for Lower Secondary Education 2005

## Teaching Experience

**Partial Differential Equations**

Oct 2021 - Jan 2022

Held weekly classes, graded assignments, midterms, and Final exam

Reference book: Boyce's Elementary Differential Equations and Boundary Value Problems

Reference: fotouhi@sharif.edu

**Engineering Mathematics**

Oct 2020 - Jan 2021

Held weekly classes, graded Final exam

Reference book: Advanced Engineering Mathematics, 10th Edition, Erwin Kreyszig

Reference: daneshgar@sharif.ir

**Fluid Mechanics I**

Oct 2020 - Jan 2021

Held weekly classes for teaching

Reference book: Fundamentals of Fluid Mechanics, by Bruce R. Munson

Reference: msani@sharif.edu

## **Statics and the Strength of Materials**

Oct 2020 - Jan 2021

Held weekly classes for teaching

Reference book: Statics and Mechanics of Materials, Russell Hibbeler

Reference: msani@sharif.edu

## **Thermodynamics I**

Jan 2020 – Jul 2020

Held weekly classes for teaching, designed and graded assignments

Reference book: Thermodynamics, An Engineering Approach, eighth edition, Cengel

Reference: masoud@stanfordalumni.org

## **Software Skills**

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### **Modeling Software:**

- Solidworks: General modeling (Real-time PCR components, 3-D printer components)
- Mimics: Medical image modeling (Tibia, Carotid artery)
- 3-Matic: Clean up rough data of Mimics

### **Physics and Multi-Physics Simulation:**

- Comsol: Fluid-solid interaction, solid mechanics, laminar flow, piezoelectric, semiconductors, plates and shells, Marangoni effect, electromechanical devices, electromagnetic devices, Shape Optimization, Topology optimization, Mixing, Acoustics

### **Electrical Engineering Software:**

- Arduino: Temperature and circuit control for PCR
- Altium Designer: PCB design in Electrowetting on dielectric

### **Programming:**

- Python: numpy, pandas, scikit-learn, scipy, matplotlib, skimage, multi-thread programming, open cv, pyElastica, tensorflow, FeniCs, PyBamm
- R language: Statistical analysis, Microbiome
- Matlab: Undergraduate problems, Nonlinear optimization, COBRAToolbox
- HTML: What I need to build up my own webpage

## **Experimental Skills**

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- Dry Lab
  - Electronics (Arduino and Raspberry Pi), Multi-thread programming, and Manufacturing Image Processing
  - familiar with working with git, Github, google colab
- Wet Lab
  - Microfluidics
  - Electrospinning and co-Electrospinning
  - Gene amplification, PDMS chip fabrication, Droplet generation, Lithography
  - Familiar with Cell Culture procedure

## Graduate and Undergraduate Research Experience

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- Gait Analysis and Fall Detection Wearable Device for Parkinson's patients
- Structural role of implants in mechanoregulation of bone in proximal tibia osteotomy
- Artificial muscle fabrication with PDMS and electrodes
- Computer vision in manufacturing and production: autopiloting via medial axis transformation
- AUT's Logo on wood with a CNC machine
- Design and fabrication of Jig and fixture for a designed part

## Service and Outreach Activities

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<b>Sharif University of Technology Mentorship Program:</b> Mentor	August 2023-present
thermal runaway propagation simulation in battery pack with Python, Delaram Movahedian	
<b>Zista Gene Sharif:</b> Research and experimental development (R&D)	Sep 2020-present
Two years of leadership	
<b>Sharif University of Technology Mentorship Program:</b> Mentor	August 2022
Simulation of light uniformity for Real-time PCR, Mohammad Sayyah	
<b>Sharif University of Technology Mentorship Program:</b> Mentor	Jul 2022
Simulation of Sea Carpet, energy harvester, Shayesteh Hafezi	
<b>NeurIPS:</b> Student Volunteer	Dec 2021
<b>Kanoon Farhangi Amoozesh Organization, educational sector:</b> Tutor	Sep 2017 - Sep 2019
<b>Sina Robotics and Medical Innovators Co. Ltd.:</b> Intern	Jun 2017 - Aug 2017
<b>Future Green MicroSystems Inc.:</b> Volunteer at 3-D printing Section	Jun 2016 - Jul 2016
<b>Sanat Pajouhan Kia Co.:</b> Intern	Jun 2015 - Sep 2015

## Open Projects

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### PCR:

- Real-time droplet-based PCR
- EWOD-based PCR
- Shape Optimization of geometry of hurdles for electroosmotic mixing
- Smart coil: PCR with heat induction

### Tissue Engineering:

- Utilization of MD simulation coupled with experimental assays to optimize biocompatibility of an electrospun PCL/alginate scaffold
- In-vivo investigation of heparinized polyurethane/silk fibroin vascular graft for acute thrombogenesis prevention in a canine model

### Soft Robotics and Soft tissues:

- Simulation of a Biohybrid Microswimmer
- Brain (Ogden) tumor growth simulation in Fenics

### System Biology:

- Best microbiota for the most efficient biofuel cells
- Gut microbiome and their influences on Alzheimer's disease

#### **Fuel Cell:**

- A data-driven method for predicting thermal runaway propagation of battery modules considering uncertain conditions

## **Languages and Hobbies**

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- **Languages:** Fluent in Azari and Persian, proficient in Turkish and English
- **Hobbies:** Playing Football, Watching Sports, Hearts, Classic board games: Backgammon and chess, doing dishes