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 2017

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

- 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 the 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

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

Experimental Skills

- Electronics (Arduino and Raspberry Pi), Multi-thread programming, and Manufacturing Image Processing
- Gene amplification, PDMS chip fabrication, Droplet generation
- Familiar with Cell Culture procedure, Lithography
- Microfluidics
- Electrospinning

Graduate and Undergraduate Research Experience

- 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

Sharif University of Technology Mentorship Program: Mentor — August 2023-present
thermal runaway propagation simulation in battery pack with Python, Delaram Movahedian

Zista Gene Sharif: Research and experimental development (R&D) — Sep 2020-present
Two years of leadership

Sharif University of Technology Mentorship Program: Mentor — August 2022
Simulation of light uniformity for Real-time PCR, Mohammad Sayyah

Sharif University of Technology Mentorship Program: Mentor — Jul 2022
Simulation of Sea Carpet, energy harvester, Shayesteh Hafezi

NeurIPS: Student Volunteer — Dec 2021

Kanoon Farhangi Amoozesh Organization, educational sector: Tutor — Sep 2017 - Sep 2019

Sina Robotics and Medical Innovators Co. Ltd.: Intern — Jun 2017 - Aug 2017

Future Green MicroSystems Inc.: Volunteer at 3-D printing Section — Jun 2016 - Jul 2016

Sanat Pajouhan Kia Co.: Intern — Jun 2015 - Sep 2015

Open Projects

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:

- Simulation of a Biohybrid Microswimmer

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

- **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