

EDUCATION

University of Tehran

M.S. in Biomechanical Engineering
GPA: 19.05/20.00 (4.0/4.0)

Tehran, Iran
Sep. 2020 - Present

University of Tehran

B.S. in Mechanical Engineering
GPA: 17.76/20.00 (3.82/4.00), Last 2year GPA: 18.51/20.00 (4.0/4.0)

Tehran, Iran
Sep. 2020

RESEARCH INTERESTS

- Thermal-Fluid Science
- Computational Fluid Dynamics
- Complex Fluids
- Transport Phenomena in Biological Systems
- Targeted Drug Delivery
- Microfluidics
- Deep Learning and Neural Networks

RESEARCH EXPERIENCES

M.S. Thesis: The investigation of hydrodynamic interactions between swimming microorganism in the gastric mucus for improvement on targeted drug delivery

Advisor: Dr. A. Jafari

Aug. 2021 - Present
University of Tehran

- Researched Brinkman and Bi-viscous models to simulate the gastric mucus environment
- Scrutinized the H. pylori bacteria locomotion in the gastric mucus

Graduate Research Assistant

Computational Non-Newtonian Fluid Mechanics Lab, Head: Dr. A. Jafari

Jan. 2021 - Present
University of Tehran

- Developed a framework for coupling of MATLAB and COMSOL software to carry out 3D DNS of particle lateral movement in straight microchannels
- Detected the particle trajectory in a square-wave microchannel for different Reynolds numbers by post-processing the experimental results and comparing with the obtained numerical results
- Generated a particle tracing module for the application of targeted drug delivery in cardiovascular disease
- Examined a micro-swimmer trajectory in high Reynolds number flows through FSI simulation with Arbitrary Lagrangian-Eulerian (ALE) method

B.S. Thesis: Modeling and optimization of a condenser with phase change material used in electric vehicle heat pump cycle

Advisor: Prof. F. Kowsary

Jan. 2020 – Sep. 2020
University of Tehran

- Observed and optimized the thermal performance of PCM heat exchanger in real driving conditions
- Designed an optimal PCM heat exchanger
- Integrated the optimal PCM heat exchanger into the EV model to extend its mileage

SELECTED PROJECTS

Inertial Lift Forces on a Particle in Newtonian Fluid and Xanthan Gum Solutions

Instructor: Dr. A. Jafari

Mar. 2021 – July 2021

- Calculated position-dependent inertial lift forces for a single particle in the Poiseuille flow of Newtonian fluids and Xanthan gum solutions to detect the equilibrium positions for two different Reynolds numbers
- Assessed the validity of Power-law model for Xanthan gum solutions based on the obtained shear-rate profiles

Stability Analysis of a Laminar Wall Jet in a Decelerating External Flow

Instructor: Prof. K. Sadeghy

Mar. 2021 – July 2021

- Devised a golden-section optimization algorithm to optimize the pressure gradient parameter
- Carried out temporal stability analysis of the wall jet using spectral methods based on similarity profiles of velocity

A Novel Bubble-driven Micromixer/Micropump Based on Thermal-inkjet Technology

Oct. 2020 – Mar. 2021

Instructor: Dr. V. Bazargan

- Designed an extensible square-wave microchannel toward reaching an optimal design
- Coupled Level Set and Volume-Of-Fluid (CLSVOF) method for bubble-fluid and fluid-fluid interface tracking

Two-dimensional Incompressible Laminar Navier-Stokes and Energy Equations in C++

Oct. 2019 – Jan. 2020

Instructor: Dr. A. Jalali

- Developed a SIMPLE algorithm with finite-volume discretization to solve the NS equations and verified the results by solving the same problem with the equations of stream function and vorticity
- Programmed explicit and implicit Euler time advance schemes for the energy equation to compare their stability

PUBLICATIONS

- “Inertial lift forces on a particle in a straight microchannel of Newtonian, Power-law, and Carreau-Yasuda fluids: a simulation study toward optimized particle separation (*to be submitted*), under supervision of Dr. A. Jafari”
- Hanie Rezaei, **Mehryar Jannesari Ghomsheh**, Farshad Kowsary, Pouria Ahmadi, “Performance assessment of a range-extended electric vehicle under real driving conditions using novel PCM-based HVAC system,” [Sustainable Energy Technologies and Assessments](#), 47(101527), 2021.

TEACHING EXPERIENCES

(All in School of Mechanical Engineering, University of Tehran)

Responsibilities: assigning and grading homework, quizzes, and projects and lecturing additional course materials

Teaching Assistant, Fluid Mechanics II, Instructor: Dr. A. Jafari

Sep. 2021 – Present

Teaching Assistant, Optimization of Mechanical Systems, Instructor: Prof. F. Kowsary

Sep. 2020 – Jan. 2021

Teaching Assistant, Heat Transfer I, Instructor: Prof. F. Kowsary

Sep. 2020 – Jan. 2021

Teaching Assistant, Fluid Mechanics II, Instructor: Dr. H. Rezvantalab

Sep. 2019 – Jan. 2020

SELECTED COURSES

Graduate Level

- Non-Newtonian Fluid Mechanics (19.75/20.00), Instructor: Dr. A. Jafari
- Advanced Fluid Mechanics (19.75/20.00), Instructor: Prof. K. Sadeghy
- Fluid Mechanics in Biological Systems (19.0/20.0), Instructor: Dr. V. Bazargan
- Advanced Mathematics (17.1/20.0), Instructor: Dr. H. M. Darian
- Physiology (20.0/20.0), Instructor: Dr. B. Seifi

Undergraduate Level

- Computational Fluid Dynamics (19.5/20.0), Instructor: Dr. A. Jalali
- Optimization of Mechanical Systems (20.0/20.0), Instructor: Prof. F. Kowsary

TECHNICAL SKILLS

Engineering	ANSYS Workbench, COMSOL Multiphysics, SolidWorks
Programming	MATLAB, Python, C/C++, HTML/CSS (beginner level)
Operating Systems	Windows, Linux (beginner level)
Other	Microsoft Office, L ^A T _E X

HONORS AND AWARDS

Deep Learning and Neural Networks with Keras, Certification

Apr. 2021

IBM, Coursera

Machine Learning, Certification

Mar. 2021

Stanford Online, Coursera

Full Scholarship, M.S. Program, Exceptional Talents

July 2020

School of Mechanical Engineering, University of Tehran, Tehran, Iran

Ranked Among Top 10% of the Entry

School of Mechanical Engineering, University of Tehran, Tehran, Iran

July 2020

Full Scholarship, B.S. Program, Iranian University Entrance Exam

School of Mechanical Engineering, University of Tehran, Tehran, Iran

Aug. 2016

488th Place among 162,879 Participants, Iranian University Entrance Exam (Konkur)

2016

LANGUAGE

English: Professional Working Proficiency

- TOEFL iBT: 103 (Reading: 29/30, Listening: 26/30, Speaking: 23/30, Writing: 25/30)

Oct. 2020

Persian: Native

REFERENCES*

Dr. A. Jafari

Assistant Professor of Mechanical Engineering,
University of Tehran

- PHD Graduated from EPFL

azadeh.jafari@ut.ac.ir

Prof. F. Kowsary

Professor of Mechanical Engineering, University of Tehran

- PHD Graduated from Virginia Polytechnic Institute and State University

fkowsari@ut.ac.ir

*Others available upon request