






# Arman Asgharpour Golroudbari

a.asgharpour@ut.ac.ir • +98 (919) 609-7597 • ArmanAsq.github.io •     

## EDUCATION

- University of Tehran, Tehran, Iran** Sep 2019 – Sep 2022  
**M.Sc. in Space Engineering** - Adviser: Prof. M.H. Sabour GPA: 4.0/4.0  
Thesis: Developing Learning-based Attitude and Heading Estimation Algorithm for Autonomous Vehicles
- Academic Center for Education, Culture and Research, Tehran, Iran** Apr 2019 – Apr 2020  
**MBA – AI-based Personalized Medicine.** GPA: 4.0/4.0
- University of Applied Science and Technology, Tehran, Iran** Sep 2016 – Jun 2019  
**B.Eng. Aircraft Avionics** – Learning-based Inertial Odometry for Indoor Navigation. GPA: 3.8/4.0
- Civil Aviation Technology College, Tehran, Iran** Jan. 2013 – Sep. 2016  
**Associate Avionics**  
Key Courses: C++, Aircraft Computer, Telecommunications, Navigation Systems, Instrumentation

## RESEARCH EXPERIENCE

- Purdue University**  
**Remote Research Intern, Systematic Review of Digital Twins in Autonomous Vehicles** Oct 2023 – present  
Examining the challenges and opportunities of implementing digital twins for autonomous vehicles
- Carnegie Mellon University**  
**Research Intern** Aug 2023 – present  
Developing generative models for 3D shape representations, advancing simulations
- Milky Way Program Deep Space Initiative**  
**Research Intern, A Systematic Review on In-Space Manufacturing** Aug 2023 – present  
Leading a team for interdisciplinary research on sustainable in-space manufacturing technologies
- University of Colorado Boulder**  
**Remote Research Intern, Physics-Informed Neural Network Inertial Navigation Systems** Jul 2023 – present  
Contributing to safer and more precise navigation, particularly in unstructured environments  
Elevating the efficiency and success of search and rescue missions.
- Students' Scientific Research Center, Tehran University of Medical Sciences**  
**Researcher (utilizing Hugging Face tools and resources), ParsLLAMA** Apr 2023 – present  
Developed and implemented Persian language integration into LLAMA framework using LoRA.  
Curated and preprocessed large-scale Persian text corpus for model training.  
Designed and optimized tokenization pipeline tailored to Persian linguistic features.
- Supervisor** Mar 2023 – present  
Guiding 10+ students in creating AI medical imaging tools for early and accurate disease detection
- Oxford Machine Learning Summer School, AI for Global Goals**  
**Researcher, Cancer Detection** May 2023 – Aug 2023  
Implemented k-fold cross-validation with weighted sampling for Ensemble Learning.  
**Ranked 1st** in The Health and Medicine OxML competition track by achieving an accuracy of 82% [Kaggle].
- Fuzzy Logic Lab, University of Tehran**  
**Researcher**  
*Visual Odometry* Apr 2022 – Aug 2023  
Developed RCNN-based learning framework using KITTI dataset in Python (Keras) [GitHub].  
*Inertial Attitude Estimation* Jan 2020 – Sep 2022  
Enhanced attitude estimation accuracy by 40% using hybrid RCNN-based models [GitHub].  
Conducted comprehensive validation against conventional SFAs (KF Family, QUEST, FQA, CF).
- Space Lab, University of Tehran**  
**Researcher**  
*Exoplanet Transit Detection* Jun 2023 – Sep 2023  
Applied signal processing techniques to detect subtle transit patterns  
*Galaxy Redshift Analysis* May 2023 – Aug 2023  
Developed data analysis pipelines for extracting redshifts from SDSS (Sloan Digital Sky Survey) galaxy spectra  
*Inertial Odometry* Sep 2022 – Aug 2023  
Developed end-to-end learning framework for inertial odometry trained by OxIOD, RONIN, and RIDI datasets.  
Employed Hyperparameter Optimization (PBT and Bayesian Optimization) in PyTorch [GitHub].  
*Celestial Mechanics Visualization* Oct 2022 – Feb 2023  
Developed a visualization tool to illustrate the Solar System using Python  
*Quantum Computing* Sep 2020 – Aug 2021  
Explored **Quantum Dot Qubits** for scalable and fault-tolerant quantum computation  
Investigated **Paul Trap** for quantum information storage and manipulation  
Explored **Superconducting Qubits**, pushing quantum coherence boundaries for future technologies  
*RK4 Orbit Integrator* Jan 2020 – Sep 2020  
Developed an RK4 Orbit Integrator for precise and efficient numerical simulation

Advancing trajectory predictions for enhanced asteroid impact modeling  
Orbit Determination *Jan 2020 – Sep 2020*  
Conducted orbit determination based on initial conditions and gravitational forces  
*CanSat Competition* *Sep 2019 – Sep 2020*  
Applied OpenCV to implement optimized ORB-SURF feature detection algorithms via Raspberry Pi.  
Implemented EKF parameter optimization, ensuring precise state estimation.  
*Fuzzy-based Torino Scale* *Sep 2019 – Jan 2020*  
Implemented Fuzzy Logic to enhance asteroid threat assessment via the Torino Scale.  
Optimize decision-making processes in asteroid impact risk analysis.

**Aviation Industry Training Center, Avionics Lab**

**Research Assistant** *Oct 2018 – Sep 2020*  
Mentored +20 undergraduate students on their thesis project.  
Designed and assembled PCBs for fire extinguisher and Flight Management System (FMS) simulator.

**PUBLICATIONS** A. Asgharpour, M. H. Sabour, “End-to-End Deep Learning Framework for Real Time Inertial Attitude Estimation using 6DoF IMU,” *Measurement*, Jun 2023.  
A. Asgharpour, M. H. Sabour, “Recent Advancements in Deep Learning Applications and Methods for Autonomous Navigation: A Comprehensive Review,” *Journal of Field Robotics*, Under Review 2023.  
A. Asgharpour, M. Raissi, “Solving Inertial Navigation System Equations Using Physics-Informed Neural Networks,” *IEEE Robotics and Automation Letters*, Work in Progress, 2024.  
A. Asgharpour, S.A. Đurđević, D.K. Mathur, “The Future of In-Space Manufacturing: A Systematic Review of Emerging Technologies, Trends, and Applications for Sustainable Space Exploration and Off-Earth Colonization,” *Acta Astronautica*, Work in Progress, 2024.  
A. Asgharpour, Z. Wang, “Exploring the Horizon: A Systematic Review of Digital Twins in Autonomous Vehicles - Unveiling Current Innovations and Envisioning Future Prospects,” *IEEE Transactions On Intelligent Vehicles*, Work in Progress, 2024.

**SKILLS**

**Programming:**

- *ROS, Python (PyTorch, TensorFlow, Keras), MATLAB, L<sup>A</sup>T<sub>E</sub>X*

**Machine Learning:**

- *Deep Learning (LSTM, CNN, TCN), Reinforcement Learning*

**Computer Vision:**

- *OpenCV, Image Processing, Object Detection, Facial Recognition*

**Natural Language Processing:**

- *LLM, QA Models, BERT, Sentiment Analysis, Text Classification*

**Data Science:**

- *SQL, MySQL, PySpark*

**CAD-CAM:**

- *SolidWorks, Inventor, Proteus, Altium Designer*

**Hardware:**

- *Arduino, Raspberry Pi, Sensor Interfacing, Actuator Interfacing, PCB Design*

**Hyperparameter optimization:**

- *Grid & Random Search, Population-based Training, Bayesian Optimization, ASHA*

**Astrophotography:**

- *Image capture and processing with telescopes and cameras (DSLRs, CCDs)*
- *Image calibration, stacking, deconvolution (DeepSkyStacker, PixInsight)*
- *Deep-sky imaging, including narrowband and H-alpha imaging*
- *Data analysis using Astropy, Matplotlib, and NumPy*

**Observational Astronomy:**

- *Telescope operation: mounting, operating (Celestron, Sky-Watcher, GSO)*
  - *Mounts: Altazimuth, Equatorial, GoTo*
  - *Telescope types: Refractor, Reflector, Catadioptric, H-alpha*
- *Celestial navigation, star tracking, familiarity with astronomical databases (SIMBAD)*

**ACADEMIC SERVICES****Supervising**

Supervisor, *Tehran University of Medical Sciences(TUMS)*  
Supervised **six** systematic reviews.

*Jul 2023 – Present*

Thesis Supervisor, *Aviation Industry Training Center*  
Supervised **five** undergraduate theses.

*Sep 2019 – Sep 2021*

**Teaching**

Co-Instructor, *TUMS*

*Sep 2023 – Present*

Teaching Assistant, *University of Tehran*

*Sep 2022 – Jan 2023*

Instructor *Aviation Industry Training Center*

*Sep 2018 – Sep 2021*

**Taught 11 courses** covering electronics, navigation, and aviation to **150+** students

**Review Activities**

**Referee of Research Council**, *Students' Scientific Research Center*

*Apr 2019 – Present*

**Journals:**

IEEE Transactions on Instrumentation & Measurement, **40 Papers**

The Aeronautical Journal, **3 Papers**

Elsevier Aerospace Science and Technology, **14 Papers**

Space: Science & Technology, **4 Papers**

Elsevier Measurement, **4 Papers**

IEEE Instrumentation & Measurement Magazine, **1 Paper**

IEEE Open Access Journal on Circuits and Systems, **1 Paper**

**Conferences**

International Federation of Automatic Control (IFAC) World Congress 2023, **1 Paper**

American Control Conference (ACC) 2024, **1 Paper**

**WORK EXPERIENCE**

**Lead AI Engineer**, *Hotelsazi Darya*

*Aug 2023 – Present*

Developing a conversational QA model to improve customer service by swiftly addressing common queries.

Employed QLoRA to fine-tune Language Models (BERT, LLAMA, and GPT) through Hugging Face.

**Mentor**, *Space Generation Advisory Council*

*Nov 2020 – Present*

Provide targeted guidance, deliver personalized advice, and offer ongoing support to mentees.

**Intern – Aircraft Avionics**, *Iran Air, Tehran, Iran*

*Jun 2018 – Oct 2018*

Conducted checks on the Airbus A-320's engine and avionics instruments using Aircraft Maintenance Manual

Executed inspection routine, identifying and rectifying anomalies to ensure compliance with safety standards

**EXTRA CURRICULAR ACTIVITIES**

**AI Programming with Python – Nano degree**

*Aug 2023*

Organized by: Udacity and Amazon

**Oxford Machine Learning Summer School – 62 Hours**

*Jun 2023*

Organized by: AI for Global Goals, CIFAR, and the University of Oxford's Deep Medicine Program

**University of Colorado Boulder (Coursera) – 20 Hours**

*Jun 2023*

Deep Learning Applications for Computer Vision

**DeepLearning.AI (Coursera) – 24 Hours**

*May 2023*

Neural Networks and Deep Learning

**Oxford Machine Learning Summer School – 48 Hours**

*Aug 2022*

Covered topics including the mathematics of machine learning, neural networks, and probabilistic ML

**USERN Research Week 6 Courses – 24 Hours**

*Sep 2021*

**Including:** 1. Systematic Review, 2. Data Analysis in SPSS, 3. Scientific Writing, 5. Meta-analysis

**University of Toronto (Coursera) – 26 Hours**

*Mar 2021*

State Estimation and Localization for Self-Driving Cars

**AWARDS & HONORS**

**AWS AI & ML Scholarship – Amazon & Udacity**

**2023**

**Ranked 1st – OxML Competition Track @ Oxford Machine Learning Summer School**

**2023**

**Appreciated Presenter – USERN Miniature Talk Competition**

**2021**

**Ranked top 10% in M.Sc. Aerospace Eng. – National University Entrance Exam**

**2019**

**Ranked 1st in class 2019 – University of Tehran, Dept. Aerospace**

**Medalist – Iran Martial Arts Federation, National Competitions**

**Gold Medalist**

**2011, 2012, 2018, 2019**

**Silver Medalist**

**2015**

**Bronze Medalist**

**2016, 2019**

**Black Belt Dan II – Nearu Martial Arts**

**2015**

**LEADERSHIP EXPERIENCE**

**World Astronomy Week (Iran), Executive Member**

*Jan 2017 – Jan 2023*

**Astronomy Outreach, University of Tehran**

*Jan 2021 – Sep 2023*

**Tehran University of Medical Sciences**

*Jan 2014 – Jul 2023*

*Executive Member*

- 24th Iranian Conference on Health Professions Education
- Inter-professional collaboration in the Covid-19 Era: Pros and Cons
- 4th Student Education Development Festival
- 20th, 21st, and 23rd Conference of Annual General Meeting

**Universal Scientific Education & Research Network**

*Jan 2021 – Jan 2022*

*Executive Member*

- 6th International USERN Congress & Prize Awarding Festival
- Health & Art, 7th International Festival of Paintings for Pediatric Patients

**University of Tehran**

*Sep 2019 – Jun 2020*

**Core Member** – *Cultural Society KARA*

**Organizer** – *Climate Change Conference*

**HOBBIES & INTERESTS**

Stargazing & Astrophotography, Astronomy Outreach, Chess, Martial Arts, Fine Tuning LLMs.

**REFERENCES**

**Maryam Karbasi**

Research Group Supervisor

m-karbasimotlagh@sina.tums.ac.ir

**Mohammad H. Sabour**

MSc Supervisor

mohammad.sabour@concordia.ca

**Mandana Shirazi**

Advisor

mshirazi@sina.tums.ac.ir