

Aerospace engineering researcher in orbital mission design, numerical optimization, and space-resource economics; author or coauthor of four journal articles and one conference paper.

**Research interests:** Astrodynamics and mission design; flight dynamics and control; aerospace systems design; computational modeling and optimization.

## EDUCATION

**M.Sc. in Aerospace Engineering (Space Engineering)** 2018–2021 Tehran, Iran  
**K. N. Toosi University of Technology** · GPA 14.30/20

**Thesis:** “Technical, Economic, and Legal Modeling of the Exploitation of Mineral Resources of Near-Earth Asteroids” (2021). **Thesis supervisor:** Mahdi Jafari-Nadoushan

Modeled Lambert transfers to Ryugu, Itokawa, and Bennu; optimized velocity change ( $\Delta V$ ), duration, and modeled profit with NSGA-II. Analyzed Pareto trade-offs, checked selected trajectories against published references, and separately reviewed space-resource law.

**Coursework:** Advanced Orbital Mechanics; Spacecraft Dynamics and Control; Space Mission Design; Space Systems Design.

**B.Sc. in Water Science and Engineering, Hydraulic Structures** 2014–2018 Kerman, Iran  
**Shahid Bahonar University of Kerman** · GPA 15.42/20

**Coursework areas:** Numerical methods; fluid mechanics and hydraulics; mechanics of materials and structural analysis; remote sensing; engineering economics.

## EXPERIENCE

**Data Mining Researcher** 2023–2024 Kerman, Iran  
**Kerman Regional Water Company** · Applied research project

Prepared monthly water-consumption data from four dams; assessed seasonality and stationarity. Compared SARIMA, Prophet, ANN, LSTM, and GRU on held-out data using MAE, RMSE, and MAPE; selected SARIMA for these series. Built a desktop forecasting tool with CSV import, confidence intervals, diagnostic plots, and results export.

**R&D Researcher** 2022 Kerman, Iran  
**Pangan Electronic Co.** · Industrial instrumentation and automation

Researched requirements and performance of industrial measurement and control products. Analyzed requirements for product evaluation and refinement. Translated instrument specifications into operating instructions and technical guides.

**Scientific Collaborator and Research Assistant** 2019–2021 Tehran, Iran  
**Space Research Laboratory** · K. N. Toosi University of Technology

Studied asteroid-resource missions, orbital transfers, constellation coverage, and spacecraft trade-offs with MATLAB, Python, and STK. Contributed to peer-reviewed papers and spacecraft design competitions.

## PUBLICATIONS

### Published Journal Articles

1. Namvar, M., **Amiri, E.**, and Jafari-Nadoushan, M. “Critical-Point n-Fold Coverage Evaluation for Continuous Coverage in Mega-Constellation Design.” *IEEE Access* 14, 11821–11833 (2026). doi:10.1109/ACCESS.2026.3652932.
2. **Amiri, E.**, Khani Chamani, M., Jafari-Nodoshan, M., Ghazanfarinia, S., and Khoshshima, M. “Economic Analysis of Exploitation of Lunar Resources.” *Journal of Space Science and Technology* 17(3), 1–14 (2024) [in Persian]. doi:10.22034/jsst.2024.1465.
3. **Amiri, E.** and Jafari-Nadoushan, M. “Target Selection for Asteroid Mining Mission Based on Optimal Trajectory Design.” *Aerospace Knowledge and Technology Journal* 11(1), 97–114 (2022) [in Persian]. Publisher record
4. **Amiri, E.** and Jafari-Nadoushan, M. “Challenges of Asteroid Mining from Techno-Economic and Legal Points of View.” *Journal of Technology in Aerospace Engineering* 5(1), 1–13 (2021) [in Persian]. doi:10.22034/jtae.2021.129739.

### Published Conference Paper

1. Sajjad, N., Zeinalian, A., Amirkhani, A., Arabtelgerd, Z., and **Amiri, E.** “Conceptual Design and Flight Simulation of Small Satellite Payload Recovery System Using an Autonomous Guided Parafoil Based on COTS.” 72nd *International Astronautical Congress*, Dubai (2021), IAC-21,A6,IP,20,x66306. Official paper record

## Manuscript Under Review

1. **Amiri, E.** and Jafari-Nadoushan, M. “Multi-Objective Optimization of Near-Earth Asteroid Missions for GEO Refueling Logistics.” *Engineering Applications of Artificial Intelligence*, 2026, under review.  
Developed NSGA-II optimization linking Lambert transfers, in-situ resource utilization (ISRU), and discounted cash flow for three asteroids; compared Pareto structure with MOPSO and economic sensitivity using 2,000 Monte Carlo samples per driver. Wrote the original draft.

## Manuscript in Preparation

**Uncertainty-Aware Autonomous Rendezvous and Proximity Operations.** Manuscript in preparation on relative guidance, uncertainty propagation, and collision avoidance.

## AWARDS & PROJECTS

### Microsatellite Payload Recovery 2021

RECOVE Team · First place · 2021 Rahnesan Competition · Conceptual design · Iran’s National Elites Foundation  
Evaluated recovery concepts and contributed to the electrical power subsystem of an autonomous guided parafoil.

### CubeSat Design Competition 2021

SRL-Sat Team · Top team in the conceptual design stage (Phase I) · Qualified for the simulation stage  
Responsible for the electrical power group; designed power distribution and subsystem voltage interfaces for a conceptual 6U communications CubeSat, and contributed to thermal control design.

### Maritime Communications Constellation 2020

TOOSI Constellation Team · Third place · National satellite-constellation design competition · Iranian Space Agency / Kayhan Space Innovation Center  
Contributed to CubeSat power architecture and commercial feasibility, including cash-flow estimates and target-market assessment.

## COURSE PROJECTS

**Spacecraft Dynamics and Control:** Launch-vehicle guidance implementation and 3-DOF simulation. 2019

**Spacecraft Systems Design I–II:** LEO remote-sensing mission design; CubeSat attitude control. 2019–2020

**Modeling of Dynamic Systems:** Wind-turbine modeling using bond graphs. 2020

## TECHNICAL SKILLS

**Programming and analysis:** Python, MATLAB, Simulink; numerical modeling, data mining, time-series forecasting, machine learning.

**Mission and engineering tools:** STK, ArcGIS, 20-sim, Missile DATCOM.

**Methods:** Lambert transfers, NSGA-II, PSO/MOPSO, Pareto analysis, Monte Carlo sensitivity analysis, constellation coverage, ISRU mass budgeting, techno-economic modeling.

**Research skills:** Academic writing; technical literature and documentation review; familiarity with ECSS standards.

**Documentation & design:** Microsoft Visio, Microsoft Office (Word, Excel, PowerPoint), EndNote, Adobe Illustrator.

## TRAINING & CERTIFICATIONS

Spacecraft Relative Motion Kinematics and Kinetics · University of Colorado Boulder · Coursera · 2025

STK Certification Level 1 · Ansys · 7 May 2025

Space Safety · Technical University of Munich · Coursera · 2025

Space Mission Design and Operations · EPFL · edX · 2025

Writing in the Sciences · Stanford University · Coursera · 2025

New Space Economy · EPFL · edX · 2024

The Science of the Solar System · Caltech · Coursera · 2024

Data Visualization · University of Illinois Urbana-Champaign · Coursera · 2024

Programming for Everybody · University of Michigan · Coursera · 2023

**Book Manuscript: Space Mining** · Collaborative Persian-language volume in preparation. Contributing author, Chapters 6 (Space Law) and 7 (Space Economics), covering resource governance and mission economics.

## Academic Service

- **Peer review:** One manuscript for *Acta Astronautica*, September 2026; Elsevier Certificate of Reviewing.
- **Conference service:** Executive staff, 14th National Conference on Irrigation and Evaporation Reduction.

**Languages & Tests:** **Persian:** Native · **English:** Professional working proficiency. **IELTS Academic:** 7.0 overall (Listening 7.5; Reading 8.0; Writing 6.0; Speaking 7.0). **GRE General Test:** TBD.

**Personal Interests:** Swimming, mixed martial arts, reading, music, and strategy games.

**References:** Available upon request.