Siavash Sabzy

Curriculum Vitae

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ResearchGate
Github

Research Interests

Astrodynamics
Three-Body Problem
Orbit Determination
Machine Learning

Education

- **Master of Science** — **Satellite Technology Engineering**
  Iran University of Science and Technology, Tehran, IR — **Sep. 2017 - Jan. 2020**
  GPA: 3.42/4 (17.10 / 20)
  Thesis: "Coupled Orbit and Attitude Dynamics of a Spacecraft in the Ecliptic Restricted Three Body Problem"
  Supervisor: Dr. Kamran Daneshjoo
  Advisor: Dr. Majid Bakhtiari
- **Bachelor of Science** — **Mechanical Engineering**
  Shahid Rajaee University, Tehran, IR — **Jan. 2013 - Jan. 2017**
  Thesis: "Vibration Analysis of a Rotary Shaft with Rigid or Flexible Bearings by Considering the Rotor Gyroscopic Effects"
  Supervisor: Dr. Majid Shahgholi
- **High School** — **Mathematics and physics**
  Alameh Tabatabaei High School — **Sep. 2007 - June. 2010**
  Aleshtar, Lorestan, Iran

Publications

* click on items (in the PDF-File) - to see the details of publications, academic projects and online courses.

Journals:

- **Siavash Sabzy**, Majid Bakhtiari, Elyas Rashno **"Distinguishing Periodic Attitude Motions from Poincaré Sections Using a Compatible Clustering Method"**, Nonlinear Dynamics, Springer.
- **Siavash Sabzy**, Kamran Daneshjou, Majid Bakhtiari **" Periodic attitude motions along planar orbits in the elliptic restricted three-body problem"**, Advances in Space Research, Elsevier.
- Majid Bakhtiari, Ehsan Abbasali, **Siavash Sabzy**, Amirreza Kosari **"Natural Coupled Orbit-Attitude Periodic Motions in the Perturbed-CRTBP including Radiated Primary and Oblate Secondary"**, Astrodynamics journal, Springer.

Conferences:

- **Siavash Sabzy**, Bahman Ghorbani Vaghei **"Designing Coupled Attitude and Orbit Control System of GEO Satellite During Orbit Transfer"**, 2018 (DMECONF04). **(in Persian)**
- **Siavash Sabzy**, Majid Bakhtiari, Kamran Daneshjou **"Investigating the Effect of Eccentricity and Mass Ratio of Primaries on the Structure of Lyapunov Orbits"**, The 19th International Conference of Iranian Aerospace Society.
- **Siavash Sabzy**, Meisam Farajollahi **"Dynamical Simulation of MEMS Inertial Sensor for Measuring the Gravity Gradient Torque in Low Earth Orbit"**, The 19th International Conference of Iranian Aerospace Society. **(in Persian)**
- Majid Bakhtiari, Amirhossein Panahyazdan, **Siavash Sabzy "Prediction of Earth Orientation Parameters using a hybrid Attention-based CNN-GRU Model with a Coordinate Transformation Approach"**, Journal of aerospace science and technology.

Academic Background

Academic Projects:

- Design, Implementation and Verification of the Attitude Determination and Control Algorithms for the DelFFi Satellites.
  - Supervisor: **Dr. Seyed Majid Esmaeilzadeh**
- Optimal GNSS Constellation.
  - Supervisor: **Dr. Majid Bakhtiari**
- Simulation of MEMS Inertial Earth Sensor Dynamic for Measuring Gravity Gradient Torque in Low Earth Orbit.
  - Supervisor: **Dr. Meisam farajollahi**

Online Courses:

- Machine Learning offered by Stanford University
- Reinforcement Learning Specialization offered by University of Alberta
- Spacecraft Dynamics and Control Specialization offered by University of Colorado Boulder

Other Academic Activities:

- Teacher Assistant - Advanced Orbital Mechanics
- Journal Reviewer - Nonlinear Dynamics Springer
- Semi-finalist in National Mathematics Olympiad at high school.
- Semi-finalist in National Computer Science Olympiad in two successive years at high school.

Work Experiences

- **IUST Space Research Center** - Tehran, Iran **Researcher**, Sep. 2021 - Now

  Space Mission Engineering:
  - Space Systems Simulations [Advanced]
  - Space Systems Design [Basics]
  - Space Radiations [Basics]

  GNC:
  - Orbits and Constellations Design [Advanced]
  - Orbit Determination and Control [Advanced]
  - GNSS Constellations/Reciever Simulations [Advanced]
  - Verification of the Model-Based Design approach (MIL, SIL, PIL and HIL testing) [experienced]

  Software Engineering:
  - Specific Check-Out Equipment (AOCS Testing Softwares) [Advanced]
  - Ground Station Software [Advanced]

- **LEOCT** - Tehran, Iran **Researcher**, Sep. 2018 - Jan. 2019 (Internship), Feb. 2019 - Sep. 2021 (Full-time)
  - Ephemeris Design for a Low Earth Orbit Global Navigation Satellite System [Advanced]
  - Precise Orbit Determinations (POD) [Advanced]

Language Skills

- **English** Fluent
  TOEFL: 104, (R:27, L:30, S:24, W:23)
  - **Appointment Number:** 7574603249657141
  - **Test Date:** March 02, 2024
- **Persian** Native

Skills

Programming Languages

- Matlab
- Python: Numpy, conda-orekit, pyqt5, pymoo, pandas
- Java: JavaFx, orekit

Software
- AGI STK: Systems Tool Kit
- GMAT: General Mission Analysis Tool
- SPENVIS: Space Environment Information System
- ESA MASTER tool
- ESA DRAMA tool

General Softwares
- Git
- LaTeX
- Microsoft Office

References

- **Dr. Majid Bakhtiari**
  School of New Technologies, Iran University of Science and Technology, Tehran, Iran
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  Tel: +98-912-320-6574 **Google scholar**
- **Dr. Kamran Daneshjoo**
  Department of Mechanical engineering, Iran University of Science and Technology, Tehran, Iran
  Email: kjoo@iust.ac.ir
  Tel: +98-21-77240570 **Home page**
- **Dr. Meisam farajollahi**
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