Iran University of Science and Technology, School of New Technologies
+(00) 98 912 082 4919
siavash_sabzy@alumni.iust.ac.ir
ResearchGate
Github
Date of Birth: Sep, 14, 1993: 30 years

Siavash Sabzy

Curriculum Vitae

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

Some Courses

- Celestial Mechanics and Orbital Dynamics **18.25**/20
- Satellite Attitude Determination **20**/20
- Special Courses in Satellite Technology (Sensors) **19.5**/20
- Satellite Attitude Control **19.5**/20

Online Courses

- Machine Learning (Stanford University) **Coursera certification**
- Reinforcement Learning Specialization (University of Alberta) **Coursera certification**
  - Fundamentals of Reinforcement Learning (University of Alberta) **Coursera certification**
  - Sample-based Learning Methods (University of Alberta) **Coursera certification**
  - Prediction and Control with Function Approximation (University of Alberta) **Coursera certification**
  - A Complete Reinforcement Learning System (Capstone) (University of Alberta) **Coursera certification**
- Spacecraft Dynamics and Control Specialization (University of Colorado Boulder) **Coursera certification**
  - Kinetics: Studying Spacecraft Motion (University of Colorado Boulder) **Coursera certification**
  - Kinematics: Describing the Motions of Spacecraft (University of Colorado Boulder) **Coursera certification**
  - Control of Nonlinear Spacecraft Attitude Motion (University of Colorado Boulder) **Coursera certification**
  - Spacecraft Dynamics Capstone: Mars Mission (University of Colorado Boulder) **Coursera certification**

Publications("Click to see")

- **Journals:**
- **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.
- **Siavash Sabzy**, Majid Bakhtiari, Elyas Rashno **"Distinguishing Periodic Attitude Motions from Poincaré Sections Using a Compatible Clustering Method"**, Nonlinear Dynamics, Springer. **(Under Review)**

- **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)**

Work Experiences

- **IUST Space Research Center** — **Researcher**
  Tehran, IR — **Sep. 2021 - Now**
  - Space Systems Simulations [Advanced]
  - Orbit Determination [Advanced]
  - GNSS Hardware/Software (Constellations/Reciever) Simulations [Advanced]
  - Verification of the Model-Based Design approach (MIL, SIL, PIL and HIL testing) [experienced]
  - Space System Design [Basics]
  - Space Radiations [Basics]
  - Ground Station Software [Basics]
- **LEOCT** — **Researcher**
  Tehran, IR — **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]

Research Experiences

- Finding periodic solutions in complex environments e.g. using and handling search methods for finding periodic dynamical (attitude/orbit) behaviors (Poincaré Sections, etc.); differential correction algorithms (Shooting Methods, as a mean for generating periodic orbit/attitude motions in multi-body systems) and solar sailing
- Investigation on Machine Learning and optimization methods for Astrodynamics Applications
- Investigation on the orbital motion of uncontrolled objects in multi body systems e.g. solar system

Language Skills

- **English** Fluent
  TOEFL: 96, R:28, L:28, S:20, W:20
  - **Appointment Number:** 4033 1062 1446 1655
  - **Test Date:** June 05, 2021
- **Persian** Native

Skills

Programming Languages
- Octave
- Matlab
- Python: Numpy, conda-orekit, pyqt5

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

General Softwares
- LaTeX
- Microsoft Office

Academic Projects

- Analysis of the Spacecraft Attitude Dynamics in the CR3BP by the Mean of Maximum Gravity Torque Surfaces.
  - Supervisor: **Dr. Majid Bakhtiari**
- Design, Implementation and Verification of the Attitude Determination and Control Algorithms for the DelFFi Satellites.
  - Supervisor: **Dr. Seyed Majid Esmaeilzadeh**
- Investigating the Periodic Solutions of the Coupled Orbit-Attitude Perturbed Circular Restricted Three-Body Problem.
  - Supervisor: **Dr. Majid Bakhtiari**
- Simulation of MEMS Inertial Earth Sensor Dynamic for Measuring Gravity Gradient Torque in Low Earth Orbit.
  - Supervisor: **Dr. Meisam farajollahi**
- Investigating the Effect of Eccentricity and Mass Ratio of Primaries on the Structure of Lyapunov Orbits.
  - Supervisor: **Dr. Kamran Daneshjoo, Dr. Majid Bakhtiari**
- Satellite Lifetime Simulation.
  - Supervisor: **Bahman Ghorbani Vaghei**

References

- **Dr. Majid Bakhtiari**
  School of New Technologies, Iran University of Science and Technology, Tehran, Iran
  Email: bakhtiari_m@iust.ac.ir
  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**
  School of New Technologies, Iran University of Science and Technology, Tehran, Iran
  Email: farajollahi@iust.ac.ir
  Tel: +98-21-73225825 **Google scholar**