

# Siavash Sabzy

## Curriculum Vitae

Iran University of Science and Technology, School of New Technologies

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ResearchGate

Github

Date of Birth: Sep, 14, 1993: 30 years



### Research Interests

Astrodynamics

Three-Body Problem

Orbit Determination

Machine Learning

### Education

#### Master of Science

**Iran University of Science and Technology, Tehran, IR**

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

**Satellite Technology Engineering**

**Sep. 2017 - Jan. 2020**

#### Bachelor of Science

**Shahid Rajaei University, Tehran, IR**

Thesis: "Vibration Analysis of a Rotary Shaft with Rigid or Flexible Bearings by Considering the Rotor Gyroscopic Effects"

Supervisor: Dr. Majid Shahgholi

**Mechanical Engineering**

**Jan. 2013 - Jan. 2017**

#### High School

**Alameh Tabatabaei High School**

Aleshtar, Lorestan, Iran

**Mathematics and physics**

**Sep. 2007 - June. 2010**

### 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 Daneshjoo, 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. (Accepted)

#### 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 Daneshjoo "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"

## 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]

#### **AOCS:**

- Orbits and Constellations Design [Advanced]
- Orbit Determination and Control [Advanced]
- GNSS Hardware/Software (Constellations/Receiver) 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 [Basics]

### ○ 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:** 96, R:28, L:28, S:20, W:20 (**expired**)

- **Appointment Number:** 4033 1062 1446 1655
- **Test Date:** June 05, 2021
- **Next Test Date:** soon.

### ○ Persian    Native

## Skills

### **Programming Languages**

- Matlab
- Python: Numpy, conda-orekit, pyqt5, pymoo
- 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**

- 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 DeFFi Satellites.
  - Supervisor: **Dr. Seyed Majid Esmailzadeh**
- 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**

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