Naeimeh Najafizadeh

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Professional Profile

- Progressive Engineer having over 5 years of experience as an Aerospace engineer in control systems and attitude control design
- Computer Proficiencies include: MATLAB, Simulink, Python, AutoCAD, C#, Unity3D, STK (Systems Tool Kit), EES (Engineering Equation Software), ABAQUS, ANSYS, AAA (Advanced Aircraft Analysis Software), Digital Datcom
- Strong experience in spacecraft dynamics modeling, simulation and verification with MATLAB/Simulink
- Possesses in-depth background in space mission geometry modelling & simulation
- Working knowledge of development of Arduino-based Embedded systems
- Demonstrated strong skills in technical documentation and presentation, written and oral communication and proactive problem-solving

Professional Experiences

ADCS Simulation Engineer   August 2022 – Ongoing
UMSATS, Mechanical Engineering Dept., University of Manitoba, Winnipeg, MB

- Engage in PCB design of the ADCS main board
- Assist subsystem lead for the CDR presentation
- Assist members in simulation design of reactions wheels

Graduate Research Assistant   Sept 2019 – August 2022
StarLab, Mechanical Engineering Dept., University of Manitoba, Winnipeg, MB

- Developed a nonlinear simulation in Simulink for attitude control of a spin stabilized CubeSat actuated with magnetorquers to achieve three-axis stabilization in the orientation needed which provides 21 (deg) pointing accuracy
- Developed a robust control toolbox with three magnetorquers, a three-axis gyroscope, a three-axis magnetometer and a two-axis sun sensor
- Developed the spacecraft kinematics based on quaternion
- Presented a precise environmental perturbations block including unknown dynamics
- An Extended Kalman Filter (EKF) design for state estimation in and outside eclipse with 3 inputs and innovative dimension reduction technique which improved the attitude accuracy to 0.18 (deg)
- Designed an innovative power management scenario for the CubeSat space mission
- Power simulations to determine the power consumption and the power generation, in the nominal mode and the worst case

ADCS Lead   Oct 2019 – Sept 2021
StarLab, Mechanical Engineering Dept., University of Manitoba, Winnipeg, MB

- Attitude Determination and Control Subsystem (ADCS) Lead of Iris CubeSat (previously known as Manitoba Satellite)
- Collaborated with ADCS hardware team to create an integrated design for ADCS software
- Developed a high-fidelity simulator for attitude determination and control including orbit propagator, environmental perturbations, sensors noises, and actuator constraints

- Modified, created & maintained ADC subsystem level requirements
- Created the manufacturing, assembly and test plans for ADC subsystem
- Communicated with multidisciplinary team of mechanical and electrical leads to verify the requirements and research and development of new algorithms and solutions
- Presented the Iris CubeSat's Pre-CDR and CDR for CSA (Canadian Space Agency) members

Teacher Assistant   Jan 2020 – Ongoing
University of Manitoba, Winnipeg, MB

- Teaching Assistant in Dynamics and Kinematics Course in Mechanical Engineering Department for 6 consequent semesters
- Support the advisors in providing individual attention to the students during group tutorial sessions
- Verify and track attendance of students, observe student performance, contribute to reports, and maintain records as required

Executive Member   Jan 2020 — Ongoing
IEEE Winnipeg, MB

- Membership Development Chair
- Share and demonstrate to future members the real value and benefit of IEEE membership and help in the membership elevation process.
- Help in senior membership elevation
- Coordinate IEEE day event in 2020 and 2022
- Monitored and managed the IEEE memberships within COVID time which resulted in meeting recruitment and retention goals for two consecutive years

System Engineer (Contract Part time)   Feb 2016 — Aug 2016
Vehicle Technology Research Institute, Amirkabir University of Technology, Tehran, Iran

- System engineer and member of control subsystem of the first national HEV Design Team (Hybrid Dena Sedan) in a Concurrent Engineering Environment
- Created & maintained all subsystem level requirements upon European and Iranian standards
- Collaborated with other subsystems for group reports

GE-CF6 Turbofan Engine System Analyzer (Internship)   Jun 2015 — Sep 2015
Iran Air, Tehran, Iran

- Successfully completed an internship and conducted a research study on the main systems of GE-CF6-50,-80A1-A3 turbofan Engines

Product Assurance Analyzer (Internship)   Jun 2013 — Nov 2013
AUT SAT (Amirkabir University of Technology Satellite), Tehran, Iran

- Successfully conducted research study in Product Assurance Section on OSHA (Operation and Support Hazard Analysis) in the field of Satellites. Further created a sample template of OSHA tasks and work packages for AUT SAT.

Education

MSc in Mechanical Engineering   Sep 2019 — August 2022
University of Manitoba, Winnipeg, MB
Dissertation topic: Nonlinear Magnetic Attitude Control for Underactuated Satellite;
Supervisor: Dr. Philip Ferguson

- Course work: Systems Modeling and Simulation with Unity 3D, Spacecraft Dynamics and Control, Agent-based Modeling with Netlogo, Space Systems Engineering

MSc in Aerospace Engineering   Sep 2015 — Jan 2018
University of Tehran, Tehran, Iran
Dissertation topic: Optimal Robust Fuzzy and Sliding Mode Controllers Design for Attitude Control of Geostationary Satellite with Statistical Optimization Analysis; Supervisor: Dr. Mahdi Fakoor; Thesis grade: Excellent

- Presented a novel adaptive Fuzzy-PID controller for attitude control of a geostationary satellite actuated by a momentum wheel and 3 thrusters
- Design and comparison of 4 different controllers; sliding mode controller, fuzzy controller, adaptive fuzzy-PID controller and robust adaptive fuzzy PID controller
- Design of a supervisory controller to ensure the stability of the closed-loop control system
- Multi-objective genetic algorithm (MOGA) used to obtain the optimum values of the fuzzy RAPID control gains and the learning rates of adaptation laws

BSc in Aerospace Engineering   Sep 2008 — Sep 2015
Amirkabir University of Technology (Polytechnic of Tehran), Tehran, Iran
Dissertation topic: Analysis of the main systems of GE-CF6-80A3 turbofan Engine; Supervisor: Dr. Hossein Khaleghi; Thesis grade: Excellent

- Analysis of the main subsystems (classic, emergency and supply) of the GE-CF6 series turbofan engine
- Created an educational set with the GE-CF6-80A3 Turbofan Engine, with a 3-month training background in Iran Air
- Creatively labelled all pneumatic, lubrication, ventilation, fuel and ignition lines with standing banners to complete the educational set for Engine Workshop Course
- Assembly and integration plan for graduate students who researched turbofan engines
- Supervised a group of 8 undergraduate junior volunteer students while creating the educational set

Honors

Best MSc thesis Award – Satellite Engineering   Feb 2019
Iranian Aerospace Society, Tehran, Iran

Best BSc Thesis Award – Aerospace Engineering   Feb 2017
Iranian Aerospace Society, Faculty of Amirkabir University of Technology, Tehran, Iran

- For the incorporation of theoretical and experimental knowledge and creating an educational set at the16th international conference