

# Saunon Malekshahi

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## EDUCATION

**University of California, Berkeley**, Berkeley, CA  
B.S. in Mechanical Engineering

Aug 2015 – May 2019

Notable Coursework: Introduction to Robotics | Control of Unmanned Aerial Vehicles | Aerodynamics | Mechatronics Design | Fluid Mechanics | Design of Microprocessor-Based Mechanical Systems | Dynamic Systems and Feedback

## EXPERIENCE

**Natilus Inc.**, Richmond, CA  
*Aerodynamics Intern*

Jun 2017 – Present

- Leading aerodynamic design for a 3.4T blended-wing-body (BWB) unmanned, cargo aircraft
- Designed and submitted a high-altitude, multirotor UAV concept for the NASA Airborne Science Program, capable of spanning different flight envelopes and endurance requirements
- Spearheaded projects in CFD analysis, aircraft stability and control simulations, systems integration for unmanned aircraft, and composite manufacturing

**NASA Ames Research Center | Berkeley Emergent Space Tensegrities (BEST) Laboratory**, Berkeley, CA  
*Undergraduate Researcher*

Jun 2016 – Present

- Developed the TT-4mini V2 Spherical Tensegrity Robot in collaboration with NASA Ames Research Center; first planetary scouting vehicle capable of climbing inclines exceeding 24°
- Co-authored publication accepted to the IEEE IROS 2017 Conference detailing implementation of multi-cable actuation control scheme to enhance robot's locomotive ability on inclined surfaces
- Optimized functionality of the TT-4mini with modularizing capability and a mobile, Bluetooth-enabled control platform
- Co-authored publication submitted to the IEEE ICRA 2017 for a prototyping platform of spherical tensegrity robots that reduces manufacture and assembly time

## PUBLICATIONS

- [1] Malekshahi, S.R.; Monge, L.D.; Martinez, M.; "Introducing a Technical Feasibility Framework for a Commercialized, Low-Latitude SpacePort," in *Acta Astronautica*, Nov 2018.
- [2] Anand, R.; English, A.; Gao, D.; Malekshahi, S.R.; Sinha, R.; Stevenson, N.; "Goldeneye AB1," in *NASA Advanced Air Vehicles Symposium*, Langley, VA, Sep 2017.
- [3] Chen, L.H.; Cera, B.; Zhu, E.L.; Edmunds, R.; Rice, F.; Bronars, A.; Tang, E.; Malekshahi, S.R.; et al., "Inclined Surface Locomotion Strategies for Spherical Tensegrity Robots," in *Intelligent Robots and Systems*, Vancouver, Canada, Sep 2017.
- [4] Chen, L.H.; Romero, O.; Zhu, E.L.; Daly, M.C.; Cera, B.; Ghahani, F.; Malekshahi, S.R.; et al., "Modular, Elastic Lattice Platform for Rapid Prototyping of Spherical Tensegrity Robots," in *International Conference on Robotics and Automation*, Singapore, May 2017.

## PROJECTS & COMPETITIONS

**TI-CO, Central America SpacePort | Carao Ventures, Asociación Centroamericana de Aeronáutica y del Espacio, DIT Space** May 2018 – Present

- Directed orbital mechanics research in an interdisciplinary study developing an operational framework for spacecraft launch services from Costa Rica
- Programmed a trajectory modeling tool for launch to orbital insertion, given strict launch latitude and orbital inclination requirements
- Co-authored preprint submitted for review to Acta Astronautica, detailing methodology of conducting near-equator launches into low-inclination orbits

**Phorcys rax | Manta Ray-Inspired UUV for Mapping Subaqueous Environments** January 2018 – May 2018

- Developed an underwater terrain-mapping UUV for shallow water scouting applications
- Developed a submersible, unmanned vehicle inspired by manta ray anatomy, capable of generating real time renders of underwater terrain
- Vehicle is a tapered, fixed-wing configuration; manta ray anatomy yielding optimal solution for wide sensor sweep areas, payload storage, and reduced wake for propulsive efficiency

**Aptiv-Sponsored Autonomous Vehicle | Model Predictive Control (MPC) Laboratory** August 2017 – Present

- Integrated lane-keeping, obstacle avoidance, and cruise-control functionalities to the MPC BARC vehicle
- Built robust object detection scheme, through lidar-camera sensor fusion; geometric association of image pixels with corresponding points in lidar cloud

**TT-Unisphere | NASA Ames Research Center** August 2017 – December 2017

- Designed and manufactured new spherical tensegrity robot capable of locomotion via an actuator-powered lattice
- Programmed a RF wireless protocol control scheme capable of delivering simultaneous manipulation of multiple tensegrity robots

**Proyecto Irazú, Biomass-Growth Measuring Cube Satellite | ACAE, Tecnológico de Costa Rica** May 2017 – June 2017

- Conducted FEA on satellite mechanical subsystems, and component integration for the Proyecto Irazú CubeSat
- First satellite domestically produced in Costa Rica, launched into orbit aboard SpaceX CRS-14 Mission to ISS

**Goldeneye AB1 Supersonic Transport | NASA Aeronautics University Design Challenge** January 2017 – June 2017

- Designed a commercial supersonic business jet to meet NASA performance and environmental goals by 2025
- Pioneered design for a variable geometry, delta wing delivering high-lift in subsonic and supersonic regimes
- Claimed Honors out of 26 competing teams; only student team to win a prize without any aerospace engineering students. Invited to present submission at Langley Research Center Winner's Symposium

**Izdihar (1st Place), Hack.SYRIA | Jusoor Syria, Haas AMENA Center for Entrepreneurship and Development** April 2017

- Developed virtual mental health service platform linking medical professionals to resettling refugees in receiving psychological treatment and consultation

## SKILLS & INTERESTS

Software: Python, MATLAB, ROS, LabVIEW, L<sup>A</sup>T<sub>E</sub>X, SolidWorks, AVL

Technical: CFD, FEA, Composite Manufacturing, Machining, CNC, Additive Manufacturing

Languages: Spanish & Farsi (native proficiency), Portuguese (working proficiency)

Interests: Biomimicry, Supersonics, Piloting (Certified Pilot), Volleyball (Cal Club Team), Middle Eastern Politics, Cooking