Maxwell Afshar Urbani

(650) 619-4030
urbani@college.harvard.edu

Education

Harvard University, Cambridge, MA - CLASS OF 2021, Bachelor of Arts in Engineering Sciences - Mechanical Engineering and Applied Math.

Work Experience

Lighter Than Air Research and Exploration, Mechanical Engineer (Sept. 2021-Present), Engineering intern (Feb. 2018- Sept. 2021)

Engineering, design, testing, manufacturing, and assembly of a large rigid airship. Some notable projects include:

- Optimized emergency ballast dump from a distributed ballast system. Implemented in C++ with NLP to solve the general case. Individual high speed routine using properties of the pseudo-inverse for the special case where an evenly distributed dump is desired.
- Designed, manufactured and programmed an automated chafe testing machine using sensors to identify cycles of failure for different specimens. Controlled via arduino. Machine capable of loading a specimen up to 1000 lbs, cycling continuously for millions of cycles, and sensing when the specimen fails. Designed and soldered PCB.
- Automated stage for alignment of assembly parts in 5 axes with less than 0.3mm tolerance. Faro laser scanner for measurement.
- Engineered and assembled a mobile 10m tall tower and rotation mechanism to secure an even larger rotating structure.
- Designed and led installation of airframe walkway systems.
- Wrote an automated zeroing program for the Shopbot. Program cut out hundreds of hours of manufacturing time.
- Mechanical design for various ground support applications.

Fung Collaboratives, Redwood City CA, *Public Art Consultant*, Dec. '17 - June. '18
Art curation specialized in realizing public artworks, exhibitions, and events. Worked closely with the Redwood City government to create the Redwood City Master Vision. A plan to create an outdoor museum throughout the City.
See the Redwood City Public Arts Master Vision here

TechShop, Redwood City CA, *Dream Consultant*, Oct. 2017- Nov. 2017

Consulted members on the engineering, design, and fabrication of their projects. Operation and maintenance of industrial and CNC machinery.

Extracurricular Activities/Organizations

Harvard MATE ROV Underwater Robotics Team, Cambridge, MA - 2016-2017
CFO, Co-Founder, Mechanical Engineer.

Designed and created a robotic underwater rover to compete in the MATE ROV competition. Created team, manufacturing plan, frame design, waterproofing. Raised $11,000 for production and travel

Harvard Undergraduate Design Labs, *Founder, Project Manager, Treasurer.*

Coalition of engineers and artists coming together to work on creative projects.

Technical Skills

Programming - C, Matlab & Simulink, Python, Arduino, Javascript, SQL

Algorithm Design.

Mechanical Design - Solidworks, FEMAP, AutoCAD

Linear Algebra applications in Image Processing, Data Compression, Page Rank, ODE and PDE,and Machine Learning.

Linear and Nonlinear Dynamics. System modeling.

Control Theory. Designing controllers including PID and LQR.

Robotics. Modeling, Kinematics, Motion Planning, Dynamics, Control

Electrical Engineering. Circuit Design and Analysis

Fluid mechanics, Electromagnetism and thermodynamics.

Interests

Using abstract ideas and mathematics to solve problems and design things that make a difference in the real world!