Karl Roush

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Overview

Eagle Scout, BS/MS Aerospace Engineering; research experience with jet engine design & drones, hands-on shop experience through various research projects and competitive racing teams. Interest in designing/increasing efficiency of aerospace systems- esp. propulsion. Additional interests in cybersecurity et. al

Education

Aug 2017 – May 2020	Aug 2020 – *Dec 2021*
Georgia Institute of Technology, BS Aerospace Engineering	**Georgia Institute of Technology, MS Aerospace Engineering**
Summer 2018 Oxford Program, ΣΓΤ Honor society	BS/MS AE Honors program
GPA: 3.80, Graduated with Highest Honors	

Experience

Fabrication Lead- Aerospace Systems Design Laboratory — Aug 2018 – Present
Air Force Research Lab: Aerospace Propulsion Outreach Program

-AFRL engineering design competition: increased the thrust/weight ratio of a small gas turbine engine by 13.67%
-Currently working on solutions to wind-milling and small scale thrust vectoring

UTSR Gas Turbine Industrial Fellowship — May 2019 – Aug 2019
Southwest Research Institute: Department of Energy, Office of Fossil Energy

-Determined viability of hybrid cycle UAVs for surveillance missions & created an NPSS tool for subsequent mission analysis
-Designed and built laser PIV system for <10% of quoted industry cost for low speed turbulence testing
-Standardized NPSS unit conversions for international use, streamlined data collection of drag testing (65% time reduction)

Competitive Innovation Consultant — May 2017 – Present
MindSumo: A competitive problem-solving platform; Awarded wins from AAA, Mozilla, NASA, Siemens, GSK, et. al

-Ranked in the top 5 of 350,000+ solvers, Chosen as a winner for 93% of competitions (Mindsumo All-Star average= 20%)

Projects

Engine Component Preliminary Design — Aug. 2019- Present
Designed & optimized: compressor, combustor, and turbine of a small, single spool turbojet engine; evaluated off-design performance

Electrical Engineering/CS Student Researcher: Rutgers WINLAB — Sept 2016- Aug 2017
EE/CS robotics-based projects: 3D Spectrum Sensing Map via Drone Mounted Receiver, Drone Gesture Based Control, Smart Electronic Bicycle

Notable Awards/Certificates

Eagle Scout Rank Award, Bronze Palm and Gold Palm — Mar 2015
Awarded Bronze Palm in October 2015, Gold Palm September 2016

Wells Fargo Campus Analytics Challenge Winner (Two Times) — Dec 2018, 2019
Machine learning analytics challenge, 2018= model for minimizing carbon footprint, 2019= Topic generation based on NASA datasets

International Best Use of Data- NASA Space Apps Hackathon — Sept 2016
First Place Overall (Project: EvaS)- Space Apps Next Gen NYC Hackathon Challenge

Developed a search for Extra-Vehicular Activities via NASA's public data in HTML/CSS and JavaScript over the course of ~14 hours

Skills and Certifications

Programs: NPSS, SolidWorks, MATLAB, Git	**Languages:** Python, C++, HTML/CSS, JavaScript	
Machine shop certified	**Class 4 Laser Safety Certified**	**German, Latin**
Mill, lathe, band saw, drill press, sanders	Laser and Lab Safety Training	ILR Level 2 fluency

Clubs and Activities

American Institute of Aeronautics & Astronautics	**GreyHat, Information Security**	**GT Hytech Racing (FSAE)**
Chair, GT Student Chapter	Vice President	Aero/Composites sub-team

Relevant Coursework

Propulsion System Design	Adv. Aircraft Propulsion	Optimization Algorithms	Aircraft Design	Flight Dynamics & Controls

Personal Interests

Rapid Prototyping	Metal work & painting	Information security	Machine learning	Service via *Eagles@GT*