

Karl Roush

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Complete Research Repos

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

Georgia Institute of Technology, BS Aerospace Engineering
Summer 2018 Oxford Program, ΣΤΤ Honor society
GPA: 3.80, Graduated with Highest Honors

Aug 2020 – Dec 2021

Georgia Institute of Technology, MS Aerospace Engineering
BS/MS AE Honors program

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

Mill, lathe, band saw, drill press, sanders

Class 4 Laser Safety Certified

Laser and Lab Safety Training

German, Latin

ILR Level 2 fluency

Clubs and Activities

American Institute of Aeronautics & Astronautics

Chair, GT Student Chapter

GreyHat, Information Security

Vice President

GT Hytech Racing (FSAE)

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*