KARL ROUSH

US Citizen

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EDUCATION

MS Aerospace Engineering

Georgia Institute of Technology
BS/MS AE Honors Program
GPA: 4.00, 2020- *2021*

BS Aerospace Engineering

Georgia Institute of Technology
Highest Honors (2017- 20)
ΣΓΤ Honor society

SKILLS

Engineer:

NPSS	MATLAB
SolidWorks	Git

Program:

Python	JavaScript
C++	HTML/CSS

Design:

Photoshop	Blender
Premier	GIMP

Build:

Class 4 laser	Water jet
Drill press	Sanders
Mill	Lathe

Languages:

German	ILR 2
Latin	ILR 2

ORGANIZATIONS

American Institute of Aeronautics and Astronautics
Graduate Liaison, 2020-present
Chair, 2019-20

GreyHat, Information Security
Vice President, 2019-20
Public Relations Chair, 2018-19

GT Hytech Racing (FSAE)
Aero/Composites sub-team

COURSEWORK

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

INTERESTS

Machine Learning
Additive Manufacturing
Information Security
Special Effects
Service via *Eagles@GT*

EXPERIENCE

Aerospace Systems Design Lab

Graduate Research Assistant — May 2020 – Present
-Designing space-based ISR architectures to support military operations in polar regions
-Analysis of a refurbishable hypersonic reconnaissance vehicle and associated design space exploration
-Review of aviation stakeholder emissions policies & technologies targeting a carbon neutral 2050
-Compilation and analysis of numerous smart airport technologies for FAA prioritization

Fabrication Lead, AFRL APOP — May 2020 – Present
-Yearly AFRL engineering design competition
-Responsible for the fabrication and assembly of all components for both testing and final design
-Increased the thrust/weight ratio of a small gas turbine engine by 13.67% using 3D printed deswirl vanes
-Developed a combined IGV solution for windmill prevention and 2D thrust vectoring

Southwest Research Institute/Dept. of Energy — May 2020 – Present

UTSR Gas Turbine Industrial Fellow
-Determined viability of hybrid cycle UAVs for ISR missions created NPSS tool for mission analysis
-Designed & built laser PIV system for <10% of quoted industry cost for low speed turbulence testing
-Standardized NPSS unit conversions and conventions for international use
-Streamlined riblet drag testing data collection (65% time reduction)

MindSumo — May 2017– Present

Competitive Innovation Consultant
-Ranked in the top five of 350,000+ solvers across over 3,000 universities and 50+ countries
-Chosen as a winner for 93% of competitions (MindSumo All-Star average= 20%)
-Awarded wins from AAA, Mozilla, NASA, Siemens, DoD, NSIN, GSK, Swanson et. al

Rutgers Wireless Information Network Lab — Sept 2016- Aug 2017

Electrical Engineering/CS Student Researcher
-Mentorship program: 3D Spectrum Sensing Map via Drone Mounted Receiver
-EE/CS robotics-based projects: Drone Gesture Based Control, Smart Electronic Bicycle

RESEARCH

Analysis of Aviation Emissions Policies — Aug 2020 – Oct 2020
-Compiled stakeholder roadmaps (organizations, airlines) to hit 2050 emissions targets
-Developed attainability metric for influential technologies

Jet Engine Cycle Analysis & Optimization — Aug 2020 – Oct 2020
-Off-design cycle design + analysis of a separate flow turbofan in NPSS
-Optimized engine for range in a scaled 737-800

Natural Language Processing Based Game Solver — July 2020
-Built a solver for the Google experiment Semantris
-Utilized Computer Vision + NLP model built from Google News data

AWARDS

Wells Fargo Campus Analytics Challenge Winner (x2) — Dec 2018, 2019
-Machine learning challenge, winners present their solutions to Wells Fargo's top data analysts
-2018= model minimizing carbon footprint, 2019= NASA dataset topic generation

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

International Best Use of Data- NASA Space Apps Hackathon — Sept 2016
-Developed Extra-Vehicular Activity search engine in JavaScript over the course of ~14 hours

PROJECTS

RTX On Contest, Thermal Management Systems
-Utilized Blender's Cycles rendering engine to demonstrate the importance of Thermal Management Systems

Titanfall Smart Pistol MK5
-Designed, modeled, and constructed a replicate Titanfall Smart Pistol MK5 (1820 print hours)

Image Compositing & Facial Recognition Cloaking
-Deployed image cloaking to thwart facial recognition algorithms via Fawkes