MICHAEL JACKS

EDUCATION

Ph.D. Aerospace Engineering
Iowa State University - Spring 2025, Fall 2028

M.S. Aerospace Engineering
Iowa State University - Spring 2024, Fall 2025

B.S. Aerospace Engineering
Iowa State University - Fall 2019, Fall 2024

RELEVANT TRAINING

- Advanced structures and Analysis
- Orbital Mechanics / Astrodynamics
- Aerospace Propulsion and Turbomachinery
- Compressible Aerodynamics
- ITAR + EAR, OPSEC from Collins/NASA

- Earned a **Private Pilot License**
- **Arnold Air Society Inductee** in the fall of 2020 in AFROTC.
- Recipient of the **NASA Iowa Space Grant Consortium**'s Research scholarship (ISGC).
- Recipient of the **ISGC Hands-on Research Grant** for Cube Satellite and small Aerospace system research.

SKILLS

- Atlassian tools – JIRA – Confluence
- Systems Modeling Software – Cameo
- Avionics Development Interface
- Wireshark and DATATrack
- JAMA and DOORS
- SolidWorks – Inventor – ANSYS
- Python & MATLAB
- LaTeX
- Git Version Control – Gitlab – GitHub
- Subversion – Tortoise SVN

REFERENCES

- Zachary Luppen – EEE Components Engineer (402) 290-7592 - Zachary.luppen@spacex.com
- Kristin Yvonne Rozier – Associate Professor (515) 294-6956 – kyrozier@iastate.edu

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Collins Aerospace - Platform Systems Avionics Testing Engineer - Spring 2023-Present

- **Created and ran test procedures** for integrated **avionics systems** of the **KC-135 Stratotanker**.
- Wrote and updated the **system design documents** for the Fuel Management and Performance System, Enhanced GPS INU, Traffic Alert and Collision Avoidance System, and Refuel Patterns.
- Modified various bits and labels on **ARINC 429, 1553, and ethernet** inputs/outputs.
- Worked with testing and troubleshooting of **Iridium and MUOS** integration onto the KC-135.
- Gained experience operating in an **agile environment** utilizing **Atlassian tools** such as **JIRA**.
- Assisted Test Directors with **hardware integration** on the **Simulated Integration Laboratory**.
- Worked with and **implemented safety** and **wish list modifications** to the Block 45 avionics system **with Air Force Pilots** who fly the KC-135.
- Created **architecture diagrams** for various **avionics components** using **Cameo Systems Modeler**.
- Understood aircraft operating procedures to catch mission critical or safety related snags.
- **Replicated** un-commanded autopilot activation and various **snags** in working avionics software.
- Learned **various standard** aircraft **avionics components** and their operation for modern aircraft.

NASA Goddard Space Flight Center – Geodesy and Geophysics Intern - Summer 2022

- **Developed** a **Python toolbox** for analyzing and visualizing **GRACE satellite** derived terrestrial water storage and **time-variable gravity data** products.
- Incorporated **least squares estimation** systems, **hydrological basin analysis**, and **mapping software** into comprehensive object-oriented toolbox.
- Performed **trend and seasonal basin analyses** with toolbox to investigate hydrologic and cryospheric signals of interest, including large river basin water storage tracking and mass loss **estimation for the Antarctic Ice Sheet**.
- Integrated **version-controlled toolbox** into AWS-based JupyterHub environment to enable cloud-based collaboration between teams across NASA sites.
- Learned **applied statistical analysis** alongside **time-variable gravity and estimation experts**.
- Used tool to **compare estimations** from **various NASA sites** for better **inter-site collaboration**.

Iowa State - Laboratory for Temporal Logic Undergrad Research - Summer 2021-Present

- **2nd author of a peer reviewed research paper** accepted for publication under the NASA Formal Methods conference in May of 2022.

Luppen, Z., **Jacks, M.** *et al*. (2022). Elucidation and Analysis of Specification Patterns in Aerospace System Telemetry. In: Deshmukh, J.V., Havelund, K., Perez, I. (eds) NASA Formal Methods. NFM 2022. Lecture Notes in Computer Science, vol 13260. Springer, Cham. https://doi.org/10.1007/978-3-031-06773-0_28

- **Wrote 265 formal specifications** in **Linear Temporal Logic** (LTL) for the **GRIFEX CubeSat**.
- **Analyzed specification similarities** between a sounding rocket, LTA helicopter, and CubeSat.
- **Integrated** the **Realizable, Responsive, Unobtrusive Unit** (R2U2) **runtime verification** software **onboard** uniquely different **small Aerospace systems** for fault analysis.
- Conducted secondary project to **detect faults** associated with **radiation exposure from TID to SEE** related incidents as a follow on to the GRIFEX case study onboard a Raspberry Pi running **NASA JPL's F-Prime framework**.
- Attended **Conference Proceedings** at **2022 NASA Formal Methods Conference** at Caltech.
- **Presented** all laboratory research work at Iowa Space Grant Consortium and Iowa State's Undergraduate **Research Symposium**.

Air Force Recruit Officer Training Corp Cadet - Fall 2019-2021 (Medically Discharged)

- High speed, high standard, low tolerance, professional officer training environment.
- Management and high stress problem solving using military techniques and training.

Cyclone Rocketry - Fall 2019-Present

- Designed and **developed** solid rocket **parachute recovery systems** while working with every team cohesively with the top level to ensure system integrated with every part onboard.
- Designed the firing mechanism and chute release systems using Solid Works.
- Added a barometer and altitude prediction software using RocketPy on the avionics team.