Liam Robinson

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EDUCATION

Purdue University – West Lafayette, IN

PhD Aeronautical and Astronautical Engineering – 4.0 GPA — January 2024 – Present

MS Aeronautical and Astronautical Engineering – 4.0 GPA — January 2023 – December 2023

BS Aeronautical and Astronautical Engineering – 4.0 GPA — August 2019 – December 2022

EMPLOYMENT

Space Situational Awareness Research – Graduate Research Assistant — October 2021 – Present

- Developing light curve inversion algorithms with Dr. Carolin Frueh's Space Information Dynamics group, estimating shape and orientation of human-made space objects from unresolved optical observations
- Introduced new light curve inversion algorithm for non-convex shapes, accelerating simulation by 10,000x
- Collaborated with PhD students on relative pose estimation and filter design for attitude estimation
- Primary operator of the Purdue Optical Ground Station telescope for light curve collection and processing

Astronomical Institute, University of Bern, Switzerland – Visiting PhD Student — May 2024 – August 2024

- Worked with Dr. Thomas Schildknecht's group on image acquisition and processing for satellite characterization

Aerospace Corporation – Graduate Astrodynamics Intern — May 2023 – August 2023

- Implemented cislunar formation flight strategies for quasi-periodic orbits in the CR3BP

Katalyst Space Technologies – Guidance, Navigation, and Control Intern — May 2022 – August 2022

- Developed Python framework for dynamic trade studies for Space Situational Awareness pipeline

Analytical Graphics, Inc. – Systems Engineering Intern — May 2021 – August 2021

- Guided 130 engineers analyzing active and planned missions in STK and ODTK

AWARDS & FELLOWSHIPS

- National Defense Science and Engineering Graduate Fellowship (NDSEG) — May 2023
- NSF Graduate Research Fellowship (GRFP) — May 2023
- NASA National Space Technology Graduate Research Opportunity Fellowship (NSTGRO) — May 2023
- Third place graduate presentation – *Purdue Aeronautics and Astronautics Symposium* — May 2023
- Best research talk, interdisciplinary research – *Undergraduate Research Conference* — May 2022
- Best undergraduate presentation – *Purdue Aeronautics and Astronautics Symposium* — May 2022

FIRST AUTHOR PUBLICATIONS

[1] L. Robinson and C. Frueh, "Light curve inversion for reliable shape reconstruction of human-made space objects," in *Proceedings of the 32nd AIAA/AAS Astrodynamics Specialist Conference*, Sep. 2022, pp. 1–19.

[2] L. Robinson, "Light curve simulation and shape inversion for human-made space objects," Master's Thesis, Purdue University, Dec. 2023.

[3] L. Robinson and C. Frueh, "A ccd/cmos telescope digital twin for space situational awareness," *TBD*, 2025, Not submitted.

RELEVANT EXPERIENCE

Founder of Boilerexams.com — November 2019 – Present

- Developed web platform used by ~15,000 Purdue students every semester to study for exams across 21 large engineering and math courses
- Lead team of 40, giving students insight into studying performance with 5,100,000 answers submitted to date
- Interfaced with the College of Engineering administrators, Vice Provosts, and members of Board of Trustees

TECHNICAL SKILLS

Algorithms: Initial orbit determination, Single and multi-target Kalman filters, Nonlinear batch estimation, Tracklet/catalog association, Optical photometry/astrometry

Languages: Python, C/C++, OpenGL/GLSL, MATLAB, SQL

Technologies: Git, Sphinx, Polars, Docker