

Daigo Kobayashi

Tuscaloosa, AL | dkobayashi@ua.edu | 765-684-2114
linkedin.com/in/daigo-kobayashi-484786148

Academic Appointments

Assistant Professor, Aerospace Engineering and Mechanics
University of Alabama, Tuscaloosa, AL

January 2026 - Present

Education

Ph.D. in Aeronautical and Astronautical Engineering, Purdue University

May 2020 – December 2025

- GPA: 4.00/4.00
- Advisor: Prof. Carolin Frueh
- Thesis: *Seeing the Unseen: Computer Vision for Space Sustainability*

M.S. in Aeronautical and Astronautical Engineering, Purdue University

August 2018 – May 2020

- GPA: 3.71/4.00
- Advisor: Prof. Carolin Frueh
- Thesis: *Exploration of Compressed Sensing for Satellite Characterization*

B.S. in Mechanical Engineering, Waseda University, Tokyo, Japan

April 2014 – March 2018

- GPA: 3.60/4.00
- Advisor: Prof. Tomoyuki Miyashita
- Thesis: *Hierarchical Optimization of Truss Support Structure for Space Solar Power Systems*

Research Interests

Space domain awareness and space traffic management
Computer vision for spacecraft autonomy
Optical and computational imaging
Pose estimation and shape reconstruction of space objects
Machine learning for space sustainability

Publications

Refereed Journal Articles

- [1] **Daigo Kobayashi** and Carolin Frueh. "Image Recovery of LEO Objects by Leveraging Optical Turbulence and Light Curves." In: Journal of Guidance, Control, and Dynamics (2024), DOI: 10.2514/1.G007634
- [2] Daniel Galea, Hsi-Yen Ma, Wen-Ying Wu, and **Daigo Kobayashi**. "Deep Learning Image Segmentation for Atmospheric Rivers." In: Artificial Intelligence for the Earth Systems (2024), DOI: 10.1175/AIES-D-23-0048.1

Refereed Conference Proceedings

- [3] **Daigo Kobayashi**, Alexander Burton, and Carolin Frueh. "AI-Assisted Near-Field Monocular Monostatic Pose Estimation of Spacecraft". In: Proceedings of the Advanced Maui Optical and Space Surveillance Technologies Conference. September 2023.

- [4] **Daigo Kobayashi** and Carolin Frueh. “Compressed Sensing for Enhanced Space Security: Resolving Details of Space Objects”. In: CERIAS 24th Security Symposium. March 2023.
- [5] **Daigo Kobayashi** and Carolin Frueh. “Image-based Satellite Characterization for Low Earth Orbit”. In: 33rd AAS/AIAA Space Flight Mechanics Conference. January 2023
- [6] **Daigo Kobayashi** and Carolin Frueh. “Reformulating Compressed Sensing to be used with SemiResolved Point Spread Function and Light Curves for Space Object Imaging: LEO”. In: Proceedings of the Advanced Maui Optical and Space Surveillance Technologies Conference. September 2022.
- [7] **Daigo Kobayashi** and Carolin Frueh. “Compressed Sensing for Satellite Characterization: Shadowing as a Sensing Matrix”. In: 8th European Conference on Space Debris. April 2021.
- [8] **Daigo Kobayashi** and Carolin Frueh. “Compressed Sensing for Satellite Characterization: A First Step Using Simulations”. In: 43rd COSPAR Scientific Assembly. February 2021.
- [9] **Daigo Kobayashi** and Carolin Frueh. “Compressed Sensing for Satellite Characterization”. In: AIAA/AAS Astrodynamics Specialist Conference. August 2020.

Teaching Experience

Instructor of Record

- AEM 264: Dynamics, Aerospace Engineering and Mechanics, University of Alabama, Spring 2026

Teaching Assistant

- AAE 590: Space Traffic Management, Purdue University, Fall 2023

Grants and Fellowships

Bilsland Dissertation Fellowship , Purdue University – \$72,000	May 2024 - May 2025
ITO International Fellowship , ITO Foundation, Japan – \$75,000	August 2018 - July 2020
Tosoh Corporation Scholarship , Tosoh Corporation, Japan – \$5,000	April 2016 - March 2018

Honors and Awards

Valedictorian, Waseda University	2018
----------------------------------	------

Service

Professional Service

Reviewer, <i>Journal of Aerospace Information Systems</i>	2025
Reviewer, <i>Journal of Spacecraft and Rockets</i>	2021
Reviewer, <i>The Astrodynamics</i>	2020

Academic Service

Mentor, Undergraduate Research Program, Purdue University	2020 - 2021
---	-------------

Research and Professional Experience

Lawrence Livermore National Laboratory, Livermore, CA

Research Intern

Summer 2023

- Validate LLNL-developed image simulator by matching real data to simulation output.
- Develop a digital twin of a large telescope to characterize the systematic distortion in astronomical imagery.

Research Intern

Summer 2022

- Identified and resolved issues in Regularized Adversarial Domain Adaptation (RADA) software and authored a user manual.
- Developed deep learning methods for predicting extreme weather events from geospatial data.

Japan Aerospace Exploration Agency (JAXA), Japan

Technical Trainee

2017 – 2018

- Reduced mass of kilometer-scale truss structures for space solar power systems by approximately 90 percent using response-surface-based structural optimization.