Risa Ito

risa.ito@colorado.edu +1 720-231-0512 Risa Ito

Education

University of Colorado Boulder Aug 2025 - Present

- Ph.D. Student in Aerospace Engineering Sciences
- Advisor: Prof. Jay McMahon

Keio University Apr 2021 - Mar 2025

- Department of Mechanical Engineering
- GPA: 3.61/4.00 (all courses); 3.85/4.00 (major)
- Graduated at the top of the department

Research Experience

Space Robotics Group, Keio University, Japan Apr 2024 - Mar 2025
Advisor: Prof. Genya Ishigami
Project: Science–aware path planning for lunar exploration based on mobility and energy risks

- Establishing the optimal path planning method considering slip and energy loss risks for the lunar water resource exploration.
- Analyzed the effectiveness of search-based algorithms for pathfinding.

Mission Design Laboratory, Institute of Space and Astronautical Science, Japan Apr 2023 - Mar 2025
Advisor: Prof. Naoya Ozaki
Project: Stochastic rendezvous trajectory design for non-cooperative spacecraft

- Proposed stochastic trajectory optimization method for deep space rendezvous docking focusing on non-cooperative spacecraft using Unscented Transform
- Demonstrated the method, taking the Mars Sample Return mission as a case study

Dynamics and Control Systems Laboratory, Georgia Institute of Technology, USA Sep 2024 - Oct 2024
Advisor: Prof. Panagiotis Tsiotras
Project: Relative self-positioning of spacecraft based on image recognition (AstroSLAM)

- Generated images based on the relative trajectories for self-localization using Unreal Engine 5
- Created trajectories in inertially fixed, Hill fixed, and tumbling modes, simulating corresponding lighting and spacecraft attitude variations along each orbit

Sekimoto Laboratory, Institute of Space and Astronautical Science, Japan Aug 2022
Advisor: Prof. Yutaro Sekimoto
Project: Research and Development on onboard instruments for JAXA's observational satellites

- Analyzed the angular dependency of radio wave absorbers using experimental equipment
- Presentation for the lecture about the electrodynamics

Creative Exercises Project, Keio University, Japan Oct 2022 - Jan 2023
Advisor: Prof. Hidetoshi Takahashi
Project: Comparative study of the shape of lunar exploration rover tires

- Conducted experiments to analyze the dependence of slip ratio and tire shape
- Designed tires in CAD and created them using a 3D printer

Publications and Conferences

Publication

- **Risa Ito** and Naoya Ozaki, "Stochastic Trajectory Design of Deep Space Rendezvous for Low-Cost Mars Sample Return", the Japan Society for Aeronautical and Space Science, April 2025.

Conference

- **Risa Ito** and Naoya Ozaki, “Mission architecture and trajectory design for low-cost Mars sample return,” The 55th JSASS Annual Meeting, The Japan Society for Aeronautical and Space Sciences, Tokyo, Japan, April 2024.
- **Risa Ito** and Naoya Ozaki, "Stochastic Trajectory Design of Deep Space Rendezvous for Low-Cost Mars sample return", The 34th Astrodynamics Symposium, Institute of Space and Astronautical Science (ISAS), Sagamihara, Japan, July 2024.
- **Risa Ito** and Naoya Ozaki, "Deep Space Trajectory design under uncertainty for low-cost Mars sample return", 68th The Japan Society for Aeronautical and Space Sciences, Himeji, Japan, November 2024 (Poster Presentation).
- **Risa Ito** and Naoya Ozaki, "Stochastic Rendezvous Trajectory Design Using Unscented Transform for Non-Cooprative Spacecraft", AAS/AIAA Space Flight Mechanics Meeting, Kaua’i, Hawaii, January 2025.
- **Risa Ito** and Genya Ishigami, "Science-Aware Path Planning for Lunar Exploration Based on Mobility and Energy Risks", the 35th ISTS, Tokushima Japan, July 2025.

Scholarships

Funai Overseas Scholarship Sep 2025 - Aug 2027

- Awarded for only 15 top Japanese students
- Partial tuition and fee coverage (up to $14,000/year), full cover of medical insurance, and a stipend of $3,000 monthly for two years

Tobitate! Study Abroad Scholarship Sep 2024 - Oct 2024

- Scholarship from the Ministry of Education, Culture, Sports, Science and Technology of Japan
- Received 670,000 yen / about 4,500 USD (calculate 1USD = 150 yen)

Work Experience

OUTSENSE Mar 2022 - Dec 2022

- Developed products using origami technology which could be applied to space architectures
- Organized STEM education events for children

asai Apr 2023 - Present

- Research and development of kits for early detection of women’s health issues
- Research project manager for blood component analysis collaborated with medical institutions
- Organized events to bridge the gender gap in STEAM

Awards

Awarded from Keio Engineering Foundataion Mar 2025

- Awarded for the No.1 bachelor student in the Department of Mechanical Engineering at Keio University among about 150 bachelor students

Poster Award at Keio Astrobiology Camp Mar 2023

- Awarded for the poster presentation on the research plan related to astrobiology among 35 participants

Techniques / Software

Programming : Julia, Python, MATLAB, C++
Other Software : SOLIDWORKS, Autodesk Fusion 360, AutoCAD, Rhinoceros, Raspberry Pi, Arduino, LaTeX
Language : Japanese(Native), English(Fluent, IELTS7.0)

Extracarricular Activities

LifeSprings Mars Mission Meeting, University of New South Wales, Australia Sep 2023

- Joined a meeting on the planning of the Mars Sample Return mission
- Presentated the mission architecture and trajectory design for the mission

Keio Astroiology Camp, Institute for Advanced Biosciences, Japan Mar 2023

- Joined special seminars by researchers from national institutions
- Conducted poster sessions and group work sessions to develop a research plan related to astrobiology