

Koshiro Yamaguchi

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William E. Boeing Department of Aeronautics and Astronautics
105 Guggenheim Hall, University of Washington, Seattle, WA, 98195

EDUCATION

University of Washington

Ph.D. student in Aeronautics & Astronautics

Seattle, WA

September 2018 - Current

Nihon University

Bachelor of Science in Aerospace Engineering; Magna cum laude

Tokyo, Japan

March 2018

EXPERTISE

- Design of aerospace/mechanical structures
- Analysis of advanced materials (composites and metamaterials)
- Optimization and machine learning techniques for aerospace/mechanical engineering

AWARDS AND HONORS

- **Funai Overseas Scholarship**, Funai Foundation for Information Technology July 2018 - July 2020
- **Dean's Award**, College of Science and Technology, Nihon University March 2018
- **Governor's Award**, Chiba, Japan March 2018
- **Ftech Scholarship**, Ftech Inc. April 2017 - March 2018
- **Kawamoto-Mori Educational Foundation Scholarship** April 2017 - March 2018
- **Merit-based Scholarship**, Nihon University April 2016 - March 2018
- **Nakamura-sekizen Educational Foundation Scholarship** April 2016 - March 2018
- **Yamaguchi Educational Foundation Scholarship** April 2016 - March 2018
- **Undergraduate Scholar Award**, Nihon University March 2017
- **2nd-place awardee**, International Gemini Mars Design Competition October 2016
- **Full-tuition Scholarship**, Nihon University April 2015 - March 2016

RESEARCH EXPERIENCE

Laboratory for Engineered Materials and Structures

Graduate Research Assistant, University of Washington (Advisor: Dr. Jinkyu Yang)

Seattle, WA

Jul. 2018 - Present

- **Origami Combinatorics**: Built a combinatorial optimization algorithm for origami tessellations via graph data structure (Supported by National Science Foundation)
- **Multiobjective Optimization on Automated Fiber Placement machines for Composite Materials**: Implemented a multiobjective Bayesian optimization on path planning of AFP machines for manufacturing efficiency (Supported by the Joint Center for Aerospace Technology Innovation and Electroimpact Inc.)
- **Data-driven Prediction of Origami Dynamics**: Built a deep-learning-based(RNN) method for the prediction of dynamics of triangular cylindrical origami, including a chaotic behavior
- **Numerical Simulation of Origami Dynamics**: Built a software to simulate the dynamics of a leaf-like origami structure with high-fidelity multiphysics 3D engine

Space Structure Systems Laboratory

Undergraduate Research Assistant, Nihon University (Advisor: Dr. Yasuyuki Miyazaki)

Chiba, Japan

April 2017 - Mar. 2018

- **Orbital Mechanics Simulator:** Developed a software to simulate the mechanics of a large-scaled structure in space
- **Modular Reconfigurable Space Structure:** Developed a prototype of modular structures for in-space assembly with installing robotics apparatuses

Laboratory for Engineered Materials and Structures

Visiting Scholar, University of Washington (Advisor: Dr. Jinkyu Yang)

Seattle, WA

Feb. 2017 - Mar. 2017

- **Origami Morphing Wing:** Developed prototypes of Origami-based morphing wings for UAVs

Mars Society's International Gemini Mars Design Competition

Subsystem Design Lead (Advisor: Dr. Hiroyuki Miyajima)

Feb. 2016 - Sep. 2016

- **Subsystems Design for Mars Flyby Vehicle:** Designed and took a lead on the conceptual subsystem design for a two-person Mars flyby vehicle

JOURNAL PUBLICATIONS

3. **K. Yamaguchi**, H. Yasuda, K. Tsujikawa, T. Kunimine, J. Yang, "Combinatorial Optimization of Auxetic Origami Tessellations", (To be submitted).
2. H. Yasuda, K. Johnson, **K. Yamaguchi**, J. Yang, "Leaf-like Origami with Bistability for Grasping Falling Objects" (To be submitted).
1. H. Yasuda, **K. Yamaguchi**, Y. Miyazawa, R. Wiebe, J. Raney, J. Yang, "Data-driven prediction and analysis for chaotic folding motions of bistable origami", (To be submitted).

CONFERENCE PRESENTATIONS

2. **K. Yamaguchi**, H. Yasuda, K. Tsujikawa, T. Kunimine, J. Yang, "Combinatorial Optimization of Auxetic Origami Tessellations", *SPIE Smart Structures + Nondestructive Evaluation*, Anaheim, CA, Apr. 2020.
1. **K. Yamaguchi**, H. Yasuda, Y. Miyazawa, R. Wiebe, J. Raney, J. Yang, "Data-driven prediction and analysis of chaotic folding motions in bistable origami", *Physics Informed Machine Learning Workshop*, Seattle, WA, Jun. 2019 (Poster presentation).

PATENTS

1. J. Yang, H. Yasuda, **K. Yamaguchi**, Y. Miyazawa, "Aircraft wing motion prediction systems and associated method", Provisional patent filing in progress

JOURNAL REVIEW

- Proceedings of the Royal Society A
- Proceedings of the National Academy of Sciences of the United States of America

INDUSTRY EXPERIENCE

Educational Design, Co., Ltd.

Developer Intern

Shizuoka, Japan

April 2018 - June 2018

- **Teaching material development:** Developed and translated teaching materials of programming for elementary and junior high students
- **Company website development:** Introduced a autonomous chatbot system to the company website
- **Classroom assistant:** Performed as a classroom assistant at programming lectures