

EUNKYU “Q” KIM

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[Personal Website](#) ◊ [LinkedIn](#) ◊ [GitHub](#)

RESEARCH INTERESTS

Fluid Mechanics, Turbulence, Dynamical Systems, Control

EDUCATION

The Cooper Union for the Advancement of Science and Art

August 2018 - May 2024

B.Eng., Major in Mechanical Engineering, Minor in Mathematics

New York, NY

Cumulative GPA: 3.82/4.00 (Major GPA: 4.00/4.00, Minor GPA: 3.74/4.00)

Vice president of SLAM Student Chapter at Cooper Union, Member of ASME at Cooper Union

Member of Korean Association at Cooper Union, Cooper Union Varsity Soccer (23-24 Season Captain)

PUBLICATION

1. **Eunhyu Kim**, Lucia Rhode, Milli Shah, "Comparative Evaluation and Refinement of Linear Algebra-Based Camera Calibration Algorithms", SIAM SIURO (Submitted)

CONFERENCE PUBLICATIONS/PROCEEDINGS

1. Dirk Martin Luchtenburg, Thomas J. Impelluso, Thorstein Ravneberg Rykkje, Jason Chen, **Eunhyu Kim**, Calder Lepitsch, Benjamin Meiner, Daniel Zaretsky, "Gyroscopic Control of Robotic Smart Vehicles Using $SO(3)$ ", ASME IMECE, 2023

RESEARCH / LAB EXPERIENCE

Multiscale Fluid Engineering Lab at Korea University

May 2023 - July 2023

Undergraduate Research Intern

Seoul, Korea

- Areas of research include microbubble-microplastic interaction and velocity field analysis of bubble-jet stream and a bio-inspired tesla valve via dynamic mode decomposition.
- Experimented on microbubble-microplastic interaction mechanism inside cyclone-induced vortices.
- Worked on a Samsung sponsored project looking to enhance dishwasher performance with microbubbles. Works include bubble image detection via MATLAB and velocity field analysis via dynamic mode decomposition.

Dynamics and Control Lab at The Cooper Union

January 2023 - Present

Student Researcher

New York, NY

- Worked as a theoretical modelling and computation specialist under Dr. D. M. Luchtenburg.
- Extensive use of virtual work principle to model complex rigid body systems. This work was published in ASME IMECE 2023.
- Passive coagulation mixing device design and scale-invariant turbulent modes identification via model order reduction and interpolation optimization for senior project (Current).
- Machine learning based approximation of tesla valve flow's governing equations (co-advised with Dr. David Wootton). This work is being prepared to be published in a peer-reviewed journal in 2024 spring (Current).

Applied Nano and Thermo Science Lab at Seoul National University

March 2022 - August 2022

Undergraduate Research Intern

Seoul, Korea

- Areas of research include laser-liquid metal activation, laser patterning, and hydrogel reinforcement.
- Used laser patterning to selectively activate liquid metal and developed a pocket-heating device. This work was presented in Materials Advances conference 2022.

Mili Lab at The Cooper Union

Student Researcher

March 2022 - Present

New York, NY

- Areas of research include optimized camera calibration algorithm and numerical linear algebra applications.
- Theoretical formulation using SVD and QR Factorization and experimental validations using marker-based motion tracking system. (peer-reviewed journal paper submitted)

CONFERENCES

1. **Eunhyu Kim**, Lucia Rhode, Mili Shah, "Comparative Evaluation and Refinement of Linear Algebra-Based Camera Calibration Algorithms", JMM 2024 (Accepted)
2. **Eunhyu Kim**, Lucia Rhode, Mili Shah, "Comparative Evaluation and Refinement of Linear Algebra-Based Camera Calibration Algorithms", SIAM NNP 2023 (Poster)
3. Chulmin Cho, Wooseop Shin, Minwoo Kim, Junhyuk Bang, **Eunhyu Kim**, Sukjoon Hong, Seung Hwan Ko, "Laser-induced entanglement of liquid metal and metallic nanowire for the monolithically variable stretchable conductor", Materials Advances, 2022

TEACHING ASSISTANT

MA326 Linear Algebra

Student grader

2023 Fall

The Cooper Union

ME424 Advanced Dynamics

Teaching Assistant

2023 Summer, 2023 Fall

The Cooper Union

MA113 Calculus II

Student grader

2022 Spring

The Cooper Union

PH291 Physics Laboratory

Teaching Assistant

2022 Fall, 2023 Fall

The Cooper Union

SKILLS

Computer Languages Tools

Python, C, C++
Altair, ANSYS, Arduino, AutoCAD, L^AT_EX, MATLAB, MS Office, Onshape, Quarto,
Raspberry Pi, Solidworks, Tensorflow, PyTorch

SCHOLARSHIP / AWARDS

Half Tuition Scholarship from The Cooper Union (2018-2024)

Innovator Merit Scholarship from The Cooper Union (2018-2024)

Dean's List from The Cooper Union (2018 Fall, 2019 Fall, 2022 Fall, 2023 Spring, 2023 Fall)

WORK EXPERIENCE

Mathematics Department Tutor

Student Tutor

Aug 2022 - Current

New York, NY

- Mathematics tutor hired by The Cooper Union Mathematics Department
- Tutoring subjects including Intro to Linear Algebra, Calculus I, Calculus II, Vector Calculus, Ordinary and Partial Differential Equations, Probability and Statistics, and Linear Algebra.

Republic of Korea Army

Infantryman

September 2020 - March 2022

Cheorwon, Korea

- Specialty in active military operations (reconnaissance, ambush, detection, CQB) in the Demilitarized Zone.

COURSES AT THE COOPER UNION

Engineering: Statics, Design Principles, Dynamics, Materials Science, Robotics Design, Solid Mechanics, Basic Circuits, Systems Dynamics, Thermodynamics, Prototyping, ROV Analysis, Fluid Mechanics, Applied Elasticity, Feedback Controls Systems, Computer Aided Engineering, Drone Control, Mechanical Vibrations, Heat Transfer, Experimentation, **Advanced Dynamics**, Manufacturing Principles, Advanced Thermodynamics, **Advanced Fluid Mechanics**, **Modern Control**, **Dynamical Systems and Data Driven Control** (2024 Spring), **Convex Optimization** (2024 Spring)

Mathematics and Physics: Intro to Linear Algebra, Calculus I, Calculus II, Vector Calculus, Probability and Statistics, Ordinary and Partial Differential Equations, **Linear Algebra**, Modern Algebra, **Complex Analysis**, Math Analysis I, Math Analysis II, **Numerical Analysis** (2024 Spring), Mechanics, Electromagnetism, Optics, Quantum Mechanics and Special Relativity, Cosmology

REFERENCES

Dr. Dirk Martin Luchtenburg, Department of Mechanical Engineering, The Cooper Union, New York, NY, USA
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Dr. Mili Shah, Department of Mathematics, The Cooper Union, New York, NY, USA
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Dr. Stanislav Mintchev, Department of Mathematics, The Cooper Union, New York, NY, USA
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Dr. David Wootton, Department of Mechanical Engineering, The Cooper Union, New York, NY, USA
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Dr. Philip Yecko, Department of Physics, The Cooper Union, New York, NY, USA
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