Ha Yun Anna Yoon

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Research Interest

Biophotonics, Systems Neuroscience, Image Processing, Machine Learning, Computer Vision, Signal Processing

Education

University of California, Berkeley *Berkeley, CA*
MS/PhD Mechanical Engineering *Expected: Fall 2026*
- Advisor: Dr. Na Ji
- Concentration: Biomechanics
- Minor: Machine Learning, Energy Science & Technology

Massachusetts Institute of Technology *Cambridge, MA*
BS Mechanical Engineering *June 2019*
- Advisor: Dr. Brett Bouma

Publications

Manuscripts

[0] Stimulation with ECoG electrodes modulates cortical activity and sensory processing in the awake mouse brain
Liang, J.F., Lee, K., Tchoe, Y., Ganji, M., Vatsyayan, R., **Yoon, H.A.**, Garrett, J., Dahye, S., Halgren, E., Ji, N. *Submitted*

[1] Effects of reducing axial resolution in two-photon calcium imaging on retrieving functional neuronal activity.
Yoon, H.A., Ferrer-Imbert, G., Charles, A., Ji, N. *Submitted*

[2] Convergence of cortical and thalamic origins of free behavior correlate in mouse V1.
Yu, P.*, **Yoon, H.A.***, Yang, Y.*, Xu, Y., Gozel, O., Tian, G., Ji, N., Doiron, B.
* = denotes equal contributions. *Submitted*

[3] Domain-Adaptive Poisson-Gaussian Diffusion for Low-Light Image Restoration.
Yoon, H.A., Hong, J. *In preparation*

[4] Multichannel Conditional Denoising Diffusion Models for Neuropil Decontamination.
Yoon, H.A., Hong, J. *In preparation*

Conferences

[5] Quantification of nonsense-free correlation uncovers the interaction between top-down and bottom-up sources of behavioral correlation in mouse V1.
Yu, P., **Yoon, H.A.**, Yang, Y., Xu, Y., Gozel, O., Ji, N., Doiron, B. *COSYNE 2025*.

[6] Integration of behavioral related correlation from top-down and bottom-up pathways in mouse V1.
Yu, P., **Yoon, H.A.**, Yang, Y., Gozel, O., Ji, N., Doiron, B. *COSYNE 2024*.

[7]Effects of reducing axial resolution in two-photon calcium imaging on retrieving functional neuronal activity.
Yoon, H.A., Charles, A., Ji, N. SfN Neuroscience 2023.

[8] Quantifying blood flow using backscattering indicator-dilution in intravascular optical coherence tomography: in vitro validation.
Uribe-Patarroyo, N., **Yoon, H.A.**, Bouma, B. *Optics in Cardiology 2018*.

[9] Flexible all-polymer multimodal fiber for integrated optogenetics.
Park, S., Guo, Y., Jia, X., Choe, H., Grena, B., Kang, J., **Yoon, H.**, Choi, G.B., Fink, Y., Anikeeva, P. *SfN Neuroscience 2016*.

Microscope Development

[10] Simulate, Design and develop 2P integrated free-space angular chirp enhanced delay (FACED) microscope v3.0.

Textbook

[0] Renewable Energy, 3rd ed.
Yoon, C.S., **Yoon, H.A.**, Yoon, J.S. *Infinity Books* 2019.

Talks

[0] Simultaneous Calcium and Voltage Imaging in mouse V1.
Samsung x Stanford KSAS x UC Berkeley KGSA Academic Conference, San Jose, CA. *Fall 2023*

Work Experience

Tomocube, Inc. *Daejeon, South Korea*
Clinical Research Intern *Summer 2019*
- Projects: Develop deep learning techniques to identify different white blood cells in AML, APL, and Lymphoma

Harvard Medical School- Wellman Center of Photomedicine *Boston, MA*
Advisors: Dr. Guillermo Tearney *2019-2020*
- Project: Develop portable, inexpensive CP-OCT system

Harvard Medical School- Wellman Center of Photomedicine *Boston, MA*
Advisors: Dr. Brett Bouma and Dr. Nestor Uribe-Patarroyo *2017-2019*
- Thesis: "Measuring coronary artery flow rates using intravascular optical coherence tomography to improve the assessment of percutaneous coronary intervention"

ExxonMobil Corporation *Spring, Texas*
Upstream Engineering Intern *Summer 2018*
- Projects: Led the proposal to monitor Steel Lazy Wave Riser from Liza Phase 1 Project
- Evaluated contract bids for Neptun Deep Project

NASA Goddard Space Flight Center *Greenbelt, MD*
Robotics Engineering Intern *Winter 2017*
- Projects: Simulate the trajectory of robotic arms for Landsat 7 for Restore-L Mission

Massachusetts Institute of Technology - Dept of Material Science and Engineering *Cambridge, MA*
Advisors: Dr. Polina Anikeeva and Dr. Seongjun Park *2015-2017*
- Projects: Develop flexible all-polymer multimodal fibers for integrated optogenetics

Korea Institute of Science and Technology - Biomedical Research Institute *Seoul, South Korea*
Advisors: Dr. Songjoo Lee *Summer 2016*
- Projects: Design lower limb prosthetics and Quantify balance control and lower limb postural

Korea Institute of Machinery and Materials - Environmental and Energy Systems *Daejeon, South Korea*
Advisors: Dr. Hongsuk Kim *Winter 2016*
- Projects: Design in-house Selective Catalytic Reduction (SCR) pumps, and Test Three-Way-Catalytic Converter to control diesel engine emission

Massachusetts Eye and Ear Infirmary - Eaton-Peabody Laboratory *Boston, MA*
Advisors: Dr. John Rosowski and Dr. Nima Maftoon *2015-2016*
- Projects: 3D CAD human middle ear using ITK-Snap and 3D Slicer to use as prosthesis

Mentoring

Brayden Ye, Undergraduate Researcher, *UC Berkeley* (2025)
Adele Beamer, Undergraduate Researcher, *Tufts University* (2025)
Kavish Loomba, Undergraduate Researcher, *UC Berkeley* (2024)
Trinav Chaudhuri, Undergraduate Researcher, *UC Berkeley* (2023 - 2026)
Erin Kim, High School Researcher, *UC Berkeley* (2023)

Teaching Experience

University of California, Berkeley

NEU C62: Drugs and the Brain, Graduate Student Instructor, *Fall 2025*
EduExplora: Ethics, Responsibility, and Innovation in Educational AI, Instructor, *Summer 2025*
EduExplora: Medical Imaging in Clinical Diagnosis and Treatment, Instructor, *Summer 2023, 2024, 2025*
MCB Biology 1AL: General Biology Laboratory, Graduate Student Instructor, *Fall 2020, Spring 2021, Summer 2021*

Massachusetts Institute of Technology

2.001: Mechanics and Materials I, Department Tutor, *Spring 2019*
2.005: Thermal-Fluids Engineering I, Department Tutor, *Spring 2019*
2.007: Design and Manufacturing I, Department Tutor, *Spring 2019*
2.008: Design and Manufacturing II, Department Tutor, *Spring 2019*
MIT Global Teaching Lab: Girls' Town Boys' Town, Head Instructor, *Winter 2019*

Awards, Fellowships, & Grants

2024	**Excellent Honor Scholarship – Korean Honor Scholarship**, Korean Embassy in the U.S.A.	*$3000*
2024-25	**Graduate Diversity and Community Fellowship**, UC Berkeley Office for Graduate Diversity	*$7500*
2024	**IEEE Photonics Society "Most Improved Chapter Award"**, IEEE Photonics Society	*$200*
2024	**H2H8 Mentor Research Program**, University of California, Berkeley	*$3,500*
2023	**H2H8 Fellowship**, University of California, Berkeley	*$10,000*
2019	**MIT Martin Prince Innovation Award**, Massachusetts Institute of Technology	*$3,600*
2015-2019	**Nordstrom Scholarship Winner**, Nordstrom	*$10,000*
2015	**Most Valuable Student**, National & Georgia Elks Association	*$11,600*
2015	**Regional Finalist**, Coca Cola Scholars Foundation	*$1,000*
2015	**National Merit Scholar**, National Merit Scholarship Corporation	*$2,500*

Service

2025 - **Reviewer**, IEEE AI, Data Science, Cyber Security and Smart Manufacturing for Sustainable Development
2023-24 **SPIE, Optica, IEEE Photonics Society**, UC Berkeley Chapter President
2023 **UC Berkeley KSEA Mentor**, Graduate Mentor
2023 **UC Berkeley Society of Women Engineers Mentor**, Graduate Mentor
2021 **Faculty Search Committee - UC Berkeley MechE Energy Science & Technology**, Student Member
2020- **MIT Educational Council**, Interviewer
2017-2019 **MIT MechE Student Advisory Committee**, Committee Member

References

Na Ji, Professor at UC Berkeley, *jina@berkeley.edu*
Gary Tearney, Professor at Harvard Medical School, *gtearney@partners.org*
Brett Bouma, Professor at Harvard Medical School, *bbouma@mit.edu*
Seongjun Park, Assistant Professor at KAIST, *spark19@kaist.ac.kr*