

HAYATO IKOMA

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AFFILIATION

Computational Imaging Group
Department of Electrical Engineering
Stanford University

TECHNICAL STRENGTHS

Programming skills	Python, Julia, JavaScript, C++, MATLAB
Research skills	image processing, computer vision, convolutional neural net computational imaging/photography, optics, grayscale photolithography
Language	English (fluent), Japanese (native)

EDUCATION

Stanford University, USA Sep. 2015 - Mar. 2021 (expected)
Ph.D. candidate, Electrical Engineering

Project: Computational imaging for fluorescence optical microscopy
Supervisor: Gordon Wetzstein

École Normale Supérieure de Cachan, France Sep. 2014 - Sep. 2015
M.S., Mathematics, Computer Vision, Machine Learning (MVA) *Très bien*

Project: Wavefront estimation for next-generation satellite telescope
Supervisor: Jean-Michel Morel (Center of mathematics and their applications (CMLA))

Massachusetts Institute of Technology, USA Sep. 2012 - Jun. 2014
M.S., Media Arts and Sciences (MIT Media Lab) *GPA: 4.9/5.0*

Project: Development of fluorescence unmixing algorithm
Supervisor: Ramesh Raskar

Kyoto University Apr. 2010 - Mar. 2012
M.S., Biophysics *GPA: 4.00/4.00*

Project: Dynamics of actin bundles in fish epidermal keratocytes
Supervisor: Yoshinori Fujiyoshi

University of Tokyo Apr. 2006 - Mar. 2010
B.S., Materials Engineering *GPA: 3.95/4.00 (major), 3.60/4.00 (overall)*

Project: Electrical property measurement of germanium crystal based on rapid melt growth
Supervisor: Akira Toriumi, Koji Kita, Kosuke Nagashio

WORKING EXPERIENCE

Google Inc. Jun. 2019 - Dec. 2019
Research intern

Project: Monocular depth estimation for computational photography

Google Inc.

Jun. 2016 - Sep. 2016

Software engineering intern

Project: Development of efficient image processing for head-mount displays

TEACHING EXPERIENCE

EE 267: Virtual Reality, Stanford University

Spring 2017, 2018, 2019

Teaching assistant

Preparation of homework starter and solution codes (JavaScript/WebGL)

Website: <https://stanford.edu/class/ee267/>

SCHOLARSHIP

Jacques Hadamard Mathematics Foundation

Sep. 2014 - Jun. 2015

Scholarship for non-French students studying mathematics (EUR 1000/month)

Funai Overseas Scholarship

Sep. 2012 - May. 2014

Scholarship for outstanding students in Japan to study abroad at graduate school (USD 30,000/yr, Tuition fee, health insurance, etc.)

Japan Student Services Organization

Apr. 2010 - Mar. 2012

Exemption from repayment of the scholarship loan program due to the excellence in the master's research (JPY 100,000/yr)

Iwadare scholarship

Apr. 2011 - Mar. 2012

Scholarship for outstanding graduate students in Japan (JPY 480,000/yr)

Nakajima Foundation

2012

Declined due to the period overlap with Funai Overseas Scholarship

Takenaka Overseas Scholarship

2012

Declined due to the period overlap with Funai Overseas Scholarship

RESEARCH PUBLICATION

Journal Articles

- [1] Xiong Dun, Hayato Ikoma, Gordon Wetzstein, Zhanshan Wang, Xinbin Cheng, and Yifan Peng. "Learned rotationally symmetric diffractive achromat for full-spectrum computational imaging". In: *Optica* 7.8 (2020), pp. 913–922.
- [2] Seung-Hwan Baek, Hayato Ikoma, Daniel S Jeon, Yuqi Li, Wolfgang Heidrich, Gordon Wetzstein, and Min H Kim. "End-to-End Hyperspectral-Depth Imaging with Learned Diffractive Optics". In: *arXiv preprint arXiv:2009.00463* (2020).
- [3] Christopher A Metzler, Hayato Ikoma, Yifan Peng, and Gordon Wetzstein. "Deep optics for single-shot high-dynamic-range imaging". In: (2020), pp. 1375–1385.
- [4] Hayato Ikoma, Michael Broxton, Takamasa Kudo, and Gordon Wetzstein. "A convex 3D deconvolution algorithm for low photon count fluorescence imaging". In: *Scientific Reports* 8.1 (2018), p. 11489.
- [5] Hayato Ikoma, Barmak Heshmat, Gordon Wetzstein, and Ramesh Raskar. "Attenuation-corrected fluorescence spectra unmixing for spectroscopy and microscopy". In: *Optics express* 22.16 (2014), pp. 19469–19483.

- [6] Makoto Goda, Mihoko Ohata, Hayato Ikoma, Yoshinori Fujiyoshi, Masazumi Sugimoto, and Ryozo Fujii. “Integumental reddish-violet coloration owing to novel dichromatic chromatophores in the teleost fish, *Pseudochromis diadema*”. In: *Pigment cell & melanoma research* 24.4 (2011), pp. 614–617.

Abstracts

- [1] Hayato Ikoma, Yifan Peng, Michael Broxton, and Gordon Wetzstein. “Snapshot multi-PSF 3D single-molecule localization microscopy using deep learning”. In: *Computational Optical Sensing and Imaging*. Optical Society of America. 2020, CW3B–3.
- [2] Barmak Heshmat, Hayato Ikoma, Ik Hyun Lee, Krishna Rastogi, and Ramesh Raskar. “Computational hair quality categorization in lower magnifications”. In: *Biomedical Applications of Light Scattering IX*. Vol. 9333. International Society for Optics and Photonics. San Francisco, USA, 2015, 93330Z.
- [3] Hayato Ikoma, Barmak Heshmat, Gordon Wetzstein, and Ramesh Raskar. “Nonlinear fluorescence spectra unmixing”. In: *CLEO*. Optical Society of America. San Jose, USA, 2014, JTh2A–9.
- [4] Achuta Kadambi, Hayato Ikoma, Xing Lin, Gordon Wetzstein, and Ramesh Raskar. “Subsurface enhancement through sparse representations of multispectral direct/global decomposition”. In: *COSI (Computational Optical Sensing and Imaging)*. Optical Society of America. Arlington, USA, 2013, CTh1B–4.
- [5] Hayato Ikoma, Jean-Marc Delvit, Christophe Latry, Carole Thiebaut, and Jean-Michel Morel. “Phase Diversity: Estimation of an Optical Wavefront from Landscape Images”. In: *Applied Inverse Problems*, Helsinki, Finland, May 2015.

Lectures, Workshops, Talks, etc.

- [1] Hayato Ikoma, Robert Konrad, Nitish Padmanaban, and Gordon Wetzstein. *Build your own VR system: an introduction to VR displays and cameras for hobbyists and educators*. Electronic Imaging Short Courses, San Francisco, USA, Jan. 2019.
- [2] Hayato Ikoma. *A convex 3D deconvolution algorithm for low photon count fluorescence imaging*. Olympus Corporation, Tokyo, Japan, July 2018.
- [3] Hayato Ikoma, Robert Konrad, Nitish Padmanaban, and Gordon Wetzstein. *Build your own VR system: an introduction to VR displays and cameras for hobbyists and educators*. Electronic Imaging Short Courses, San Francisco, USA, Jan. 2018.
- [4] Gordon Wetzstein, Robert Konrad, Nitish Padmanaban, and Hayato Ikoma. *Build your own VR system: an introduction to VR displays and cameras for hobbyists and educators*. SIGGRAPH, Aug. 2017.