

Hallee E. Wong

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Education

Massachusetts Institute of Technology, Cambridge, MA

PhD in Electrical Engineering and Computer Science 2022 – May 2026 (expected)

Topics: Computer Vision, Deep Learning, Human-Computer Interaction, Segmentation, In-Context Learning, Generative Models, Medical Image Analysis

Advisors: John Guttag and Adrian V. Dalca

SM in Electrical Engineering and Computer Science 2020 – 2022

Thesis: [Evaluating Learned and Rule-Based Policies for Hospital Bed Assignment](#)

Advisor: John Guttag

Williams College, Williamstown, MA

BA with highest honors in Mathematics, *magna cum laude* 2014 – 2018

Thesis: [Using Data to Predict Hospital Readmissions at Berkshire Medical Center](#)

Advisors: Steven J. Miller and Brianna Heggseth

Work Experience

Analysis Group, Boston, MA

Sep 2018 – Jun 2020

Analyst (Sep 2018 – Dec 2019) → Senior Analyst (Jan 2020 - Jun 2020)

- Collaborated with multi-disciplinary teams on health economics and outcomes research projects
- Built core features for a multi-million dollar analytics platform to support pricing decisions for a blockbuster cancer drug, creating multi-million dollar cost-savings opportunities for the client
- Developed and maintained functions for an internal R package used in over 100 healthcare cases per year to improve the efficiency of statistical data analysis, reducing case budgets by up to 70%

Athenahealth, Watertown, MA

Summer 2017

Data Science Intern · Supervisor: Sara Gettel

- Developed a deployable LSTM neural network to automate the detection of lab tests in doctors' notes

Research Experience

MIT CSAIL Clinical and Applied Machine Learning Group

Sep 2020 – Present

Graduate Student Researcher · Mentors: John Guttag & Adrian V. Dalca

Interactive Segmentation in Context (ongoing)

- Developing efficient prompt-able foundation models using in-context learning to enable the rapid annotation of image datasets and segmentation tasks from new domains without retraining

Data Management for Multi-Modal Medical Foundation Models (ongoing)

- The development of biomedical foundation models is limited by the lack of large diverse datasets
- Leading collaboration with Cornell Tech and Massachusetts General Hospital researchers to develop a unified database and standardized format for 150+ biomedical imaging and text datasets

Interactive Segmentation for any Medical Image

- Developed efficient deep learning tool to enable human annotators to segment new (unseen) structures in biomedical images using a few clicks, bounding boxes or scribbles [\[ECCV 2024\]](#)
- Reduced annotation time by 28% while improving accuracy by 15% compared to previous methods

Generative Models for Stochastic Segmentation

- In medical imaging, there are often multiple plausible segmentations for the same region of interest
- Devised generative models for making multiple plausible stochastic predictions, with applications to interactive segmentation [\[WiCV 2023\]](#) and uncertainty-aware in-context learning [\[CVPR 2024\]](#)

Reinforcement Learning for Resource Allocation [\[masters thesis\]](#)

- Adapted offline reinforcement learning methods to learn and evaluate policies to address a sequential resource allocation problem: reducing healthcare acquired infections through hospital bed assignment

UCLA Research in Industrial Projects for Students REU Program Summer 2018

Project Manager · Mentors: Shantanu Joshi & Cambron Carter

- Led student team and managed collaboration with research scientists from sponsor, Gum Gum Inc.
- Developed a robust computer vision pipeline for automatically augmenting crowds with advertisement in sports broadcast videos [[ACCV 2018 workshop](#)]

Williams College Department of Mathematics and Statistics Sep 2017 – May 2018

Undergraduate Researcher · Mentors: Steven J. Miller & Brianna Heggeseth

- Developed [methods](#) for analyzing the clustering of high dimensional variables in random forest models
- Identified predictors of hospital readmissions from electronic medical records, enabling Berkshire Medical Center to identify patients to prioritize for follow-up care

Williams College Department of Physics Summer 2016

Research Assistant · Supervisors: Protik Majumder & Charlie Doret

- Built lasers with custom circuitry and designed optical equipment for atomic physics experiments

Williams College Department of Astronomy Summer 2015

Research Assistant · Supervisor: Steven Souza

- Operated telescopes to record images of star clusters and processed high-frequency image data to track light emissions. Identified two previously unknown eclipsing binary stars.

Publications
[Google Scholar](#)

[ScribblePrompt: Fast and Flexible Interactive Segmentation for any Biomedical Image.](#)

Hallee E. Wong, Marianne Rakic, John Guttag, Adrian V. Dalca.

ECCV: European Conference on Computer Vision, 2024 (Acc. rate 27.9%)

Data Curation & Augmentation in Medical Imaging Workshop, CVPR 2024 (oral; 12.5% of submissions)

Bench-to-Bedside Paper Award for clinical impact

[Tyche: Stochastic In-Context Learning for Universal Medical Image Segmentation.](#)

Marianne Rakic, Hallee E. Wong, Jose Javier Gonzalez Ortiz, Beth Cimini, John Guttag, Adrian V. Dalca.

CVPR: Computer Vision and Pattern Recognition, 2024 (highlight; 2.8% of submissions)

Uncertainty Quantification for Computer Vision Workshop, ICCV 2023

[A Risk Prediction Model to Identify People Living with HIV who are High-risk for Disengagement from Care after HIV Diagnosis in South Africa.](#)

Ibrahima Dieye, Hallee E. Wong, Margaret McNairy, Hari Iyer, Gugulethu Tshabalala, Amanda Fata, Jacob Bor, Serena Koenig, Kennedy Otwombe, Ingrid Katz.

AIDS and Behavior, 2024

[Probabilistic Interactive Segmentation for Medical Images](#)

Hallee E. Wong, John Guttag, Adrian V. Dalca.

MedNeurIPS: Medical Imaging Meets NeurIPS 2022 Workshop

[Long-term burden of respiratory complications associated with extreme prematurity: An analysis of US Medicaid claims.](#)

Meredith Mowitz, Wei Gao, Heather Sipsma, Pete Zuckerman, Hallee E. Wong, Rajeev Ayyagari, Sujata P. Sarda, Csaba Siffel.

Pediatrics & Neonatology, 2022

[Real-world and natural history data for drug evaluation in Duchenne muscular dystrophy: suitability of the North Star Ambulatory Assessment for comparisons with external controls.](#)

Francesco Muntoni, James Signorovitch, Gautam Sajeev, Nathalie Goemans, ..., Hallee E. Wong, *et al.*

Neuromuscular Disorders, 2022

[Markerless Augmented Advertising for Sports Videos](#)

Hallee E. Wong, Osman Akar, Emmanuel Antonio Cuevas, Iuliana Tabian, Divyaa Ravichandran, Iris Fu, Cambron Carter.

Advanced Machine Vision for Real-life and Industrially Relevant Applications Workshop, ACCV 2018

Best Poster Award

Preprints

[Learning General-Purpose Biomedical Volume Representations Using Randomized Synthesis](#)

Neel Dey, Benjamin Billot, [Hallee E. Wong](#), Clinton Wang, Mengwei Ren, Ellen Grant, Adrian V. Dalca, Polina Golland.
Under Review

[ContextFlex: Joint Segmentation of Multiple Biomedical Images](#)

Siyu Gai, [Hallee E. Wong](#), Andrew Hoopes, John Guttag, Adrian V. Dalca.
Under Review

[Categorical Co-Frequency Analysis: Clustering Diagnosis Codes to Predict Hospital Readmissions](#)

Hallee E. Wong, Brianna Heggeseth, Steven J. Miller.
ArXiv Preprint arXiv:1909.00306, 2019

Invited Talks

Interactive Models for Universal Medical Image Segmentation

- Boston Medical Image Analysis Workshop, MIT Oct 2024

ScribblePrompt: Fast and Flexible Interactive Segmentation for any Medical Image

- LCN & Buckner Lab Meeting, Harvard University Jun 2024
- NoBrainer Meeting, MIT McGovern Institute & MGH Jan 2024
- Sabuncu Lab, Cornell Tech Oct 2023

Reviewing

Machine Learning for Health (ML4H) 2022, 2023
Healthcare AI and COVID-19 Workshop at ICML 2022

Honors & Awards

Bench-to-Bedside Paper Award for clinical impact, CVPR 2024 DCAMI Workshop 2024
Jae S. Lim Graduate Fellowship, MIT EECS 2020
Best Poster Award, ACCV 2018 AMV Workshop 2018
Robert M. Kozelka Prize in Statistics, Williams College 2018
Sigma Xi Honor Society 2018
1st Place, Athenahealth Intern Hackathon 2017
2nd Place, 7th Annual Venture Pitch Competition at Williams College 2017
Clare Boothe Luce Undergraduate Research Fellowship 2016 – 2018
NSLI-Y Scholarship, U.S. Department of State 2013

Press

MIT News ([article](#) and [video](#)), featuring our ECCV 2024 paper on interactive segmentation Sep 2024
MIT News ([article](#)), featuring our CVPR 2024 paper on stochastic segmentation April 2024

Service & Outreach

Ops Team, Machine Learning for Biomedical Imaging (MELBA) Journal 2024 - Present
Reviewer, MIT EECS PhD Admissions 2023
Mentor, MIT EECS Graduate Application Assistance Program 2020 - 2022
President, MIT Graduate Women in Course 6 (EECS) 2021
Mentor, MIT AI Mentorship Program 2020

Teaching

Graduate Teaching Assistant, MIT
▪ 6.8301 Advances in Computer Vision Spring 2023
Teaching Assistant, Williams College
▪ MATH 310 Mathematical Biology Spring 2018
▪ MATH 307 Computational Linear Algebra Fall 2017
▪ MATH 210 Math Methods for Scientists Spring 2016
▪ PHYS 130 Introduction to Mechanics Fall 2015

Technical Skills

- **Programming:** *Fluent:* Python, R · *Familiar:* C/C++, Javascript, HTML, SAS, SQL, Java, MATLAB
- **Tools:** Pytorch, OpenCV, Tensorflow, Kornia, Gradio, Streamlit, R Shiny, Git