Clinton J. Wang

(646) 897-4879 | clintonw@csail.mit.edu | clintonjwang.github.io

Summary My research focuses on medical image analysis, particularly robust and interpretable techniques for both generative and discriminative models. My projects have included analyzing brain MRI (stroke, Alzheimer's disease), liver MRI (hepatocellular carcinoma), fetal MRI (placental oxygenation), and colonoscopy videos (inflammatory bowel disease). I also work on 3D vision, including neural fields and trajectory estimation.

EDUCATION

Ph.D. Candidate, Massachusetts Institute of Technology 2020 – present
Electrical Engineering and Computer Science
Advisor: Polina Golland

S.M. Massachusetts Institute of Technology 2018 – 2020
Electrical Engineering and Computer Science, GPA: 5.0/5.0
Thesis: High fidelity medical image-to-image translation (Advisor: Polina Golland)
Coursework: Computer Vision, Inference and Information Theory, Natural Language Processing, Digital Image Processing, Analysis on Manifolds, Fourier Analysis

B.Sc. Yale University, *Magna Cum Laude* 2011 – 2015
Biomedical Engineering, GPA: 3.9/4.0

RESEARCH EXPERIENCE

MIT Computer Science & Artificial Intelligence Laboratory 2018 – present
Advised by Polina Golland
Robust, interpretable GANs for image-to-image translation on brain MRIs; few-shot segmentation of fetal MRI; discretization invariant learning on neural fields.

Iterative Scopes (Research Intern) 2022 summer
Self-supervised trajectory estimation in monocular endoscopy videos.

Yale Radiology Research Lab 2017 – 2018
Advised by Jim Duncan
Interpretable deep learning for hepatic lesion classification on MRI; tumor segmentation; statistical analysis of longitudinal image-derived features; PACS integration.

PwC (Analytics & Technology Consultant) 2015 – 2017
Semi-supervised keyword extraction and topic classification on social media feeds with LSTMs; logic and code for cleansing, matching and merging customer data for a major airline.

Yale School of Engineering & Applied Science 2014 – 2016
Advised by Stuart Campbell
Multi-scale computational model of heart muscle contraction using interacting Markov models.

SELECTED HONORS AND AWARDS

- Takeda Fellowship 2021 – 2022
- Siebel Foundation Scholar 2020
- Yale Department of Biomedical Engineering Prize 2015
- Tau Beta Pi Engineering Honor Society 2015
- International Biology Olympiad, silver medalist 2009

SELECTED JOURNAL ARTICLES & CONFERENCE PROCEEDINGS

*equal contribution

- **Pre-Trained Language Models for Interactive Decision-Making**
  Shuang Li, Xavier Puig, Chris Paxton, Yilun Du, Clinton Wang, Linxi Fan, Tao Chen, De-An Huang, Ekin Akyürek, Anima Anandkumar, Jacob Andreas, Igor Mordatch, Antonio Torralba, Yuke Zhu
  NeurIPS 2022 Oral [Paper] [Project] [Code]

- **Deep learning–assisted differentiation of pathologically proven atypical and typical hepatocellular carcinoma (HCC) versus non-HCC on contrast-enhanced MRI of the liver**
  Paula Oestmann, Clinton Wang, Lynn J. Savic, Charlie A. Hamm, Sophie Stark, Isabel Schobert, Bernhard Gebauer, Todd Schlachter, MingDe Lin, Jeffrey Weinreb, Ramesh Batra, David Mulligan, Xuchen Zhang, James Duncan, Julius Chapiro
  European Radiology 2021 [Paper]

- **Spatial-Intensity Transform GANs for High Fidelity Medical Image-to-Image Translation**
  Clinton Wang, Natalia Rost, and Polina Golland
  MICCAI 2020 [Paper] [Project] [Video] [Code]

- **Automated feature quantification of Lipiodol as imaging biomarker to predict therapeutic efficacy of conventional transarterial chemoembolization of liver cancer**
  Sophie Stark, Clinton Wang, Lynn Jeanette Savic, Brian Letzen, Isabel Schobert, Milena Miszczuk, Nikitha Murali, Paula Oestmann, Bernhard Gebauer, MingDe Lin, James Duncan, Todd Schlachter, Julius Chapiro
  Scientific Reports 2020 [Paper] [Code]

- **A probabilistic approach for interpretable deep learning in liver cancer diagnosis**
  Clinton Wang, Charlie Hamm, Brian Letzen, James Duncan
  SPIE Medical Imaging 2019 Oral [Paper] [Project] [Video] [Code]

- **Deep learning for liver tumor diagnosis part II: interpretable deep learning to characterize tumor features**
  Clinton Wang*, Charlie Hamm*, Marc Ferrante, Isabel Schobert, Todd Schlachter, MingDe Lin, Jeffrey Weinreb, James Duncan, Julius Chapiro, Brian Letzen
  European Radiology 2019 [Paper] [Project] [Code]

- **Deep learning for liver tumor diagnosis part I: development of a convolutional neural network classifier for multi-phasic MRI**
  Charlie Hamm*, Clinton Wang*, Marc Ferrante, Isabel Schobert, Todd Schlachter, MingDe Lin, James Duncan, Jeffrey Weinreb, Julius Chapiro, Brian Letzen
  European Radiology 2019 [Paper] [Code]

- **The Role of Artificial Intelligence in Interventional Oncology: A Primer**
  Brian Letzen, Clinton Wang, Julius Chapiro
  Journal of Vascular and Interventional Radiology 2019 [Paper]

- **Slowing of contractile kinetics by myosin-binding protein C can be explained by its cooperative binding to the thin filament**
  Clinton Wang, Jonas Schwan, Stuart Campbell
  Journal of Molecular and Cellular Cardiology 2016 [Paper]

WORKSHOPS

- **Approximate Discretization Invariance for Deep Learning on Neural Fields**
  Clinton Wang, Polina Golland
  New England Computer Vision Workshop 2022 Oral
  NeurIPS Symmetry and Geometry in Neural Representations 2022 [Paper] [Project] [Video] [Code]

- **High Fidelity Medical Image-to-Image Translation with Spatial-Intensity Transforms**
  Clinton Wang, Natalia Rost, Polina Golland
  MIT MGB AI Cures Conference 2022 [Project] [Code]

- **Automatic Segmentation of the Placenta in BOLD MRI Time Series**
  Mazdak Abulnaga, Sean Young, Katherine Hobgood, Eileen Pan, Clinton Wang, Ellen Grant, Esra Abaci Turk, Polina Golland
  MICCAI Preterm, Perinatal and Paediatric Image Analysis Workshop 2022 [Paper] [Code]

TEACHING

Courses

- Teaching Assistant, 6.819/6.869 Advances in Computer Vision, MIT 2021
- Guest Presenter, 6.4400 Intro to Computer Graphics, MIT 2022

Invited Talks

- Google Brain, Toronto 2022
  Deep Learning on Neural Fields
- Boston Medical Imaging Workshop 2022
  Robust counterfactual image generation with spatial-intensity transforms
- MIT-Takeda Presentation Series 2022
  Identifying radiological biomarkers with generative models

Research Mentorship

- Mentored one master's student (2023 - present) and one undergraduate student (2020)

SERVICE

Academic Service

- Program Committee, Medical Imaging Meets NeurIPS Workshop (MedNeurIPS)
- Reviewer, Conference on Neural Information Processing Systems (NeurIPS)
- Reviewer, Medical Image Analysis (MedIA)
- Reviewer, Medical Image Computing and Computer Assisted Intervention (MICCAI)

Community Service

- EECS PhD Admissions Reviewer, MIT 2022
- Graduate Student Advisory Group for Engineering (GradSAGE), MIT 2019 – 2021
  Advised the Dean of the School of Engineering on policies and initiatives for graduate students. Developed and organized leadership workshops, a leadership minor, and a leadership certificate program.
- Controller, Sidney-Pacific Graduate Residence 2019 – 2021
  Managed internal budgeting, reimbursements, accounting, and financial reporting for MIT's largest graduate dormitory (749 students).

OTHER INTERESTS

- AI-Generated Art [Portfolio]
- Music Composition [Portfolio]
  Won Honorable Mention (2012) and was finalist (2013) at ASCAP Morton Gould Young Composer Awards