

Ph.D. candidate in computer science researching 3D vision and natural language under Dr. Angel X. Chang. My research interests include 3D scene generation; scene understanding; multimodal learning, especially between vision and language; and the health and biological applications of vision and language. Previously, a senior machine learning engineer with professional experience in computer vision in healthcare, including developing and deploying models to solve machine learning problems in gastroenterology as well as experience in leading technical projects.

Education

Simon Fraser University**Burnaby, BC, Canada**

Doctor of Philosophy in Computing Science (Advisor: Angel X. Chang)

Sep 2024 - Present

Massachusetts Institute of Technology**Cambridge, MA, US**

Bachelor of Science in Computer Science and Engineering

June 2020

Master of Engineering in Electrical Engineering and Computer Science

June 2020

- Thesis: "Real-time computer-aided polyp detection and localization for clinical applications." Advisors Dr. Dennis Freeman, Amit Ranade.

Relevant Experience

Iterative Health**Cambridge, MA***Senior Machine Learning Engineer*

June 2021 - Present

Machine Learning Engineer

May 2019 - June 2021

- Led a project to build a model to provide a coarse localization of an endoscope in a colonoscopy video based on clinically relevant landmarks. Developed several of the constituent models to identify relevant features toward temporal video segmentation.
- Designed and trained models to identify IBD patients and score disease severity for the company's AI Recruitment pipeline, to flag patients who are eligible for IBD clinical trials. Models were able to reduce rate of manual review to less than 25% of videos.
- Developed a video-level model to predict the endoscopic disease severity (Mayo Endoscopic Score) of UC patients in clinical trial data, achieving an 89% accuracy rate for clinical trial qualification on a test set of UC patients.
- Designed and implemented classification and object detection networks for a product, SKOUT, to detect polyps during colonoscopies in real-time, statistically significantly improving physicians' detection of adenomas per colonoscopy during our clinical trial by 27%. SKOUT was approved by the FDA in a 510(k) submission in September 2022.
- Led a team of up to 4 ML engineers on projects for building models for AI Recruitment and landmark identification.
- Developed scalable cloud-agnostic ML training, inference, and evaluation pipelines to create and manage large datasets, train models with a variety of configurations, generate evaluation reports and visualization, and run models at scale in production

Medical Vision Lab, Computer Science and Artificial Intelligence Laboratory (CSAIL), MIT**Cambridge, MA***Undergraduate Researcher*

Feb 2019 - May 2019

- Implemented a model and loss function to investigate performance differences from running on original x-ray images versus original images augmented with enhanced images, toward semi-supervised learning for quantifying pulmonary edema severity

Iterative Health**Cambridge, MA***Associate Software Engineer*

Feb 2018 - Jan 2019

- Architected and implemented data services pipeline to process a large inflow of images and videos of colonoscopies into AWS.
- Designed schema for PostgreSQL database in AWS to store millions of image and video metadata records.
- Designed and implemented real-time video streaming infrastructure in C++ for colonoscopies from the edge (e.g. Raspberry Pi).

PAVLAB (Marine Robotics Lab), MIT**Cambridge, MA***Undergraduate Researcher*

Sep 2017 - Jan 2018

- Designed and implemented algorithm with C++ and PCL library to allow autonomous water vehicle to detect people and objects on the water using a variety of data processing and clustering algorithms on LIDAR data, toward autonomous navigation
- Work on object avoidance was presented at the *MOOS Development and Applications Working Group* in 2019.

Publications/Presentations

ZeMing Gong, **Austin T. Wang**, Joakim Bruslund Haurum, Scott C. Lowe, Graham W. Taylor, Angel X. Chang. BIOSCAN-CLIP: Bridging Vision and Genomics for Biodiversity Monitoring at Scale. *arXiv preprint*, 2024. (*under review*)

Austin T. Wang

717 Breslay St, Coquitlam, BC, Canada V3J 0J3

(510) 598-8282

atwang16.github.io

austin.t.wang@gmail.com

Pablo Millan Arias, Niousha Sadjadi, Monireh Safari, ZeMing Gong, **Austin T. Wang**, Scott C. Lowe, Joakim Bruslund Haurum, Iuliia Zarubiieva, Dirk Steinke, Lila Kari, Angel X. Chang, Graham W. Taylor. BarcodeBERT: Transformers for Biodiversity Analysis. *Proceedings of the NeurIPS Workshop on Self-Supervised Learning: Theory and Practice*, 2023.

Austin Wang, Amit Ranade, Dennis Freeman. "Real-time computer-aided polyp detection and localization for clinical applications." MEng Thesis. 2020.

Paul Robinette, Michael Novitzky, **Austin Wang**, Michael DeFilippo, Michael Sacarny, Michael R. Benjamin. "Talk-22: Obstacle Avoidance on the Remote Explorer 4." *MOOS Development and Applications Working Group*. 2019.

Patents

Jonathan Ng, Jean-Pierre Schott, Perikumar Mukundbhai Javia, **Austin Wang**, Neelima Chavali, Thomas Varner, Lavi Erisson, Sloane Allebes Phillips, Daniel Wang. "Systems and methods for analysis of medical images for scoring of inflammatory bowel disease." US 20220028547A1, United States Patent and Trademark Office, 1 Feb 2021. *Patent Pending*.

Jonathan Ng, Sloane Allebes Phillips, Amit Ranade, Daniel Wang, Perikumar Mukundbhai Javia, Avi Walden, **Austin Wang**, Evan Wlodkowski, Samriddhi Dhakal. "Systems and Methods for Detecting Potential Malignancies." US 20220028059A1, United States Patent and Trademark Office, 21 July 2020.

Other

- Extracurriculars include church, volleyball, robotics (volunteering for FIRST), building things, and music.