

Mark Endo

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EDUCATION

Stanford University

B.S. in Computer Science (AI track), Cumulative GPA: 4.051

Stanford, CA

Expected June 2023

La Jolla Country Day School

Weighted GPA: 4.85, valedictorian

La Jolla, CA

June 2018

RESEARCH EXPERIENCE

Stanford Vision and Learning Lab

CURIS Summer Research Intern

Stanford, CA

June 2022 – Present

Worked with Jiajun Wu last summer on a neuro-symbolic method for grounding human trajectories. The goal of our research is to develop a method that has a fine-grain-complex understanding of motion. I am continuing this research as my cs senior research project.

Computational Neuroscience (CNS) Lab, Stanford University

Student Researcher

Stanford, CA

June 2021 – Present

Developing novel techniques for assessing severity of Parkinson's disease with Ehsan Adeli. Our recent publication at MICCAI 2022 titled *GaitForeMer* shows that human motion forecasting serves as an effective pre-training task to learn useful motion features that can be subsequently applied to the task of motor impairment severity estimation.

Current Project - I am working on a data-driven analysis of different Parkinson's disease motor subtypes across the modalities of gait videos and fMRIs.

Stanford Machine Learning Group, Stanford University

Student Researcher

Stanford, CA

September 2020 – Present

This work started as part of the AI for Healthcare Bootcamp led by Pranav Rajpurkar and Andrew Ng. I conduct research on building reliable AI technologies for medical decision-making. I have published work on improving segmentation in chest X-rays through semi-supervised learning (*CheXseg*) and improving methods for chest X-ray radiology report generation (*CXR-RePaiR*).

Current Project - Examining the correlation between radiology report generation metrics and the scoring of reports by radiologists. Developing a methodology to predict a radiologist-determined error score from a combination of automated metrics.

PEER-REVIEWED PUBLICATIONS

Endo, M., Poston, K.L., Sullivan, E.V., Fei-Fei, L., Pohl, K.M. and Adeli, E. (2022). GaitForeMer: Self-Supervised Pre-Training of Transformers via Human Motion Forecasting for Few-Shot Gait Impairment Severity Estimation. In *International Conference on Medical Image Computing and Computer-Assisted Intervention* (pp. 130-139). Springer, Cham.

Endo, M.*, Krishnan, R.*, Krishna, V., Ng, A.Y. and Rajpurkar, P. (2021). Retrieval-Based Chest X-Ray Report Generation Using a Pre-trained Contrastive Language-Image Model. *Proceedings of Machine Learning for Health*, in *Proceedings of Machine Learning Research*, 158:209-219

Gadgil, S.U.*, **Endo, M.***, Wen, E.*, Ng, A.Y. and Rajpurkar, P. (2021). CheXseg: Combining Expert Annotations with DNN-generated Saliency Maps for X-ray Segmentation. *Proceedings of the Fourth Conference on Medical Imaging with Deep Learning*, in *Proceedings of Machine Learning Research*, 143:190-204.

Manuscripts In Review:

Yu, F.*, **Endo, M.***, Krishnan, R.*, Pan, I., Tsai, A., Reis, E.P., Fonseca, E.K.U.N., Lee, H.M.H., Abad, Z.S.H., Ng, A.Y., Langlotz, C.P., Venugopal, V.K. and Rajpurkar, P. (2022). Evaluating Progress in Automatic Chest X-Ray Radiology Report Generation.

PRESENTATIONS

OpenCV Weekly Webinar. Semi-supervised Medical Image Segmentation with CheXseg (2022).
<https://www.youtube.com/watch?v=U8P4U2nouDo&t=1598s>

Short Oral Presentation of CheXseg: Combining Expert Annotations with DNN-generated Saliency Maps for X-ray Segmentation. MIDL 2021. <https://www.youtube.com/watch?v=pUZgiuHbk2o&t=391s>

Harvard Medical AI Research Intensive: Walkthrough of a deep learning codebase.
<https://www.youtube.com/watch?v=k4yH04bnCnw>

Harvard Medical AI: Mark Endo presents Masked Autoencoders Are Scalable Vision Learners (2022).
<https://www.youtube.com/watch?v=oaac1-lAGPs>

TEACHING EXPERIENCE

Department of Computer Science, Stanford University

Stanford, CA

Section Leader, CS106

January 2020 – August 2021

Taught weekly 50-minute sections, helped students in the LaIR (office hours), graded assignments, held IGs (interactive grading) with students, and graded midterms and finals.

Small Group Leader, CS198

September – December 2020

Conducted weekly workshops with new CS106 section leaders. Topics included Leading Your First Section, Leading a Section For Everyone, and Section Pedagogy. Help introduced new SLs to the rest of the CS198 community.

INDUSTRY EXPERIENCE

Virufy

Remote

AI Engineer

July – September 2020

Developed machine learning models to detect COVID-19 from cough data. Worked on analyzing data from a crowdsourcing campaign to gather a robust dataset of coughs.

Erasmus Technology

Remote

Data Analyst

July – September 2020

Analyzed years of bond market quote data and developed software that tracked different signals of market movement. Using those market signals, applied machine learning to produce algorithmic trading strategies.

AWARDS

- 2022 Special Recognition Award for Outstanding Psychiatric Research, Stanford Department of Psychiatry and Behavioral Sciences
- 2018 High school valedictorian, La Jolla Country Day School
- 2018 Scholar-Artist Award, La Jolla Country Day School
- 2017 Cum Laude Society, La Jolla Country Day School
- 2017 Best Research Project, UCSD COSMOS Music and Technology Group

SKILLS

Languages: Python, C++, Java, Swift, JavaScript, PHP, SQL, HTML, CSS

Machine Learning: NumPy, Pandas, PyTorch, TensorFlow

Digital Audio Workstation: Logic Pro X

Music Production: Alternative R&B, Pop, Electronic

Classical, Acoustic, and Electric Guitar

Adobe Photoshop and Illustrator