Josiah Aklilu

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Education

Stanford University — Stanford, California, US
Doctor of Philosophy - Biomedical Data Science; GPA: 3.88/4 — *Sept 2020 - present*
William K. Bowes Jr. Fellow, Stanford Graduate Fellowship

University of Denver — Denver, Colorado, US
Bachelor of Science - Mathematics, Computer Science, and Physics; GPA: 3.95/4 — *Sept 2016 - June 2020*
University of Denver Distinction in Computer Science, University of Denver Hornbeck Scholar

Relevant Projects & Publications

Aklilu, J., Zhu, F., Wang, F., Yeung-Levy, S., Chan, V., Ren, S. Distilling Expert Commentary from Exocentric Video and IMU-based Motion Signals. Submission in progress (ICLR 2026)

Aklilu, J., Wang, X., Liu, Q., Yeung-Levy, S., Zambrano Chaves, J.M. Measuring Query Complexity in Pursuit of Hybrid Reasoners. Submission in progress (NeurIPS workshop)

Wang, X.*, Song, A.*, **Aklilu, J.**, Li, R., Sui, E., Heo, J., Jopling, J.K.†, Yeung-Levy, S.† Tool tracking with vision foundation models as an indicator of surgical competency: a retrospective analysis. Submission in progress (The Lancet Digital Health)

Aklilu, J., Wang, X., Yeung-Levy, S. Zero-shot Action Localization via the Confidence of Large Vision-Language Models. Published in CVPR Workshop on Video Large Language Models (VidLLMs), 2025

Rau, A., Endo, M., **Aklilu, J.**, Heo, J., Saab, K., Paderno, A., Jopling, J., Holsinger, F.C., Yeung-Levy, S. Systematic evaluation of large vision-language models for surgical artificial intelligence. arXiv, 2025

Rau, A., **Aklilu, J.**, Holsinger, F., and Yeung-Levy, S. Depth-guided NeRF Training via Earth Mover's Distance. Published in European Conference on Computer Vision, 2024.

Aklilu, J.*, Gupte, S.R.*, Nirschl, J.J., Yeung-Levy, S. Revisiting active learning in the era of Vision Foundation Models. Published in Transactions on Machine Learning Research, 2024.

Aklilu, J., Sun, M.W., Goel, S., Bartoletti, S., Rau, A., Olsen, G., Hung, K.S., Mintz, S.L., Luong, V., Milstein, A., Mark J. Ott, M.J., Tibshirani, R., Jopling, J.K.; Sorenson, E.C., Azagury, D.E.*; Yeung-Levy, S.* Artificial Intelligence Identifies Factors Associated with Blood Loss and Surgical Experience in Laparoscopic Cholecystectomy Videos. Published in New England Journal of Medicine AI, 1, 2024.

Aklilu, Josiah and Yeung-Levy, Serena. ALGES: Active Learning with Gradient Embeddings for Semantic Segmentation of Laparoscopic Surgical Images. Published in the Proceedings of Machine Learning for Health Care, 182, 2022.

Experience

PhD Research Intern — Apple, Cupertino, CA
Apple AIML - Health AI — *June 2025 - Present*

- Training multi-modal large language models for video action differencing augmented with IMU-based motion signals. Built training harness for handling over 25,000 video pairs with synchronized 6-channel IMU data.

PhD Research Intern, Biomedical AI for Precision Health — Microsoft Research, Redmond, WA
Microsoft Health Futures — *June 2024 - Sept 2024*

- Conducted DINOv2-style self-supervised pretraining of large vision models for analysis of computed tomography images, leveraging over 2 million CT volumes.
- Built a robust benchmark of paired radiology report-image data to evaluate tumor progression predictive ability measured by RECIST.

Graduate Teaching Assistant — Stanford University, Stanford, CA
Representations & Algorithms for Computational Molecular Biology — *Sep 2021 - Dec 2022*

- TA for advanced course with over 100 students in computational methods for molecular biology. Held office hours for first section of the course teaching algorithms for biological sequence alignment along with generic dynamic programming.

Undergraduate Teaching Assistant — University of Denver, Denver, CO
NoSQL Databases for Big Data — *Jun 2018 - Aug 2018*

- TA for summer introductory course with over 20 students in NoSQL Databases with topics ranging from writing queries for non-relational databases to exploring different non-relational database models like graphical (Neo4j) and document-based (MongoDB).

Recitation Instructor — University of Denver, Denver, CO
Introduction to Data Structures and Algorithms — *Aug 2017 - Aug 2019*

- Instructed 1-hr recitation sessions for over 15 students twice per week in topics discussed in lecture including key graph algorithms, asymptotic runtime complexity, sorting and string-matching algorithms, tree representations, and various algorithm design paradigms.

Recitation Instructor — University of Denver, Denver, CO
Discrete Structures — *2019*

- Instructed 1-hr recitation sessions for over 10 students in course material ranging from topics in bit-wise operations, counting, combinatorics, probability, and set logic.