Hailemariam (Haile) Teshome (He/Him/His)

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EDUCATION

University of California Los Angeles – Los Angeles, CA 2015-2021
B.S. Atmospheric and Oceanic Science

University of California Los Angeles, Extension – Los Angeles, CA 2019-2021
Completed Coursework

University of California San Diego, Division of Extended Studies – Remote 2023
Completed Coursework

University of California Berkeley, Extension – Remote 2023-2024
Completed Coursework

Relevant Coursework

Math and Comp Sci: Single and Multivariable Calculus, Linear Algebra, Discrete Math, Statistics, Probability Theory, Biostatistics, Data Structures & Algorithms, Machine & Deep Learning, Algorithm Design and Complexity, Natural Language Processing, Data Mining, Bioinformatics, Data Science, Data Visualization, Databases

Biology: Biochemistry, Molecular Biology, Cells Tissues and Organs, Evolutionary Bio and Ecology, Pharmacology, Genetics

Work Experience

Amgen Inc – Thousand Oaks, CA (Remote) July 2022 - Present
Digital, Technology and Innovation Group – Decision Sciences Team
Associate Software Engineer

- Architected and maintained scalable ETL pipelines using tools like Databricks, Gitlab, Gitlab CICD/ Jenkins, Spark, Python, AWS, and SQL to ensure efficient processing of diverse data formats from varied sources, including real-time and batch processing.
- Implement data governance frameworks for data quality and consistency, and establish robust data security protocols, including encryption and access controls, in compliance with regulatory standards.
- Developed algorithms for predictive analytics and HCP/patient segmentation using Python and integrate these models into our workflow.
- Spearheaded ChatGPT adoption across the team by creating prompts, custom GPTs, hosting workshops, and creating automated tools to complete specific tasks like data analysis and creating presentations.
- Created employee engagement activities such as Reciprocity Rings which were attended by 60+ employees and received significant positive feedback to continue hosting more sessions.
- Competed in internal Hackathons to develop new technical skills and engage in team-based development sessions to complete a project based on the theme.

Harvard T.H. Chan School of Public Health – Boston, MA June 2022 – July 2022
Department of Global Health and Population
Programmer

- Contributed to the refinement of models for simulating population estimates for COVID-19 infection rates, employing advanced statistical methodologies and algorithms in R, and customizing R packages for specific analytic requirements.
- Played a central role in the optimization of data collection and processing systems for extensive COVID-19 datasets from a variety of sources. This involved efforts in meticulous data cleansing and normalization to ensure the utmost accuracy and reliability for modeling.
- Assisted in the development and refinement of comprehensive reports and dynamic visualizations of the model findings, targeted at both internal stakeholders and external publications, utilizing D3.js and JavaScript to make complex data accessible and engaging.

UCLA Events & Transportation– Los Angeles, CA

Student Transportation Operations Associate July 2017- Aug 2018

- Demonstrated exceptional organizational and problem-solving abilities by efficiently managing high-volume parking operations for a major university campus. Skillfully coordinated space allocation, ensuring effective utilization and adherence to safety protocols.
- Excelled in a fast-paced, dynamic environment, promptly addressing and resolving diverse challenges ranging from traffic flow disruptions to emergency situations.
- Enhanced visitor experience through exemplary customer service, providing clear guidance and assistance on parking regulations, campus navigation, and event information, reflecting positively on the university's commitment to community engagement.
- Leveraged technical acumen in managing automated parking systems, contributing to the modernization and improvement of campus parking services.

Research Experience

UCLA Health and David Geffen School of Medicine – Los Angeles, CA Aug 2018 - July 2019

Department of Anesthesiology, Bioinformatics and Health Analytics Division

Software Engineer/Data Science Intern

- Developed and implemented ETL (Extract, Transform, Load) pipelines, along with in-database machine learning models using SQL, Python, and R. Notably, created tailored versions of models such as Random Forests and Support Vector Machines (SVM) to unearth relationships in longitudinal studies.
- Skillfully managed and analyzed extensive databases comprising billions of entries. Executed comprehensive data querying, processing, and cleansing operations, coupled with intricate statistical analysis to understand complex data relationships.
- Designed and constructed intuitive Tableau dashboards, enhancing data accessibility and interpretation. These dashboards played a crucial role in providing actionable insights, leading to recommended structural changes aimed at elevating the quality of patient care.

Bio and Nano Photonics Laboratory, UCLA – Los Angeles, CA Sept 2016 - Sept 2019

Howard Hughes Medical Institute Undergraduate Researcher

- Engineered innovative biomedical devices for Lyme disease detection and cell motility analysis by utilizing advanced multiplexed paper-based sensors combined with photonics and image processing techniques to analyze colorimetric signals derived from fluorescent tagging and image tracking methodologies.
- Lead the development of a MATLAB-based image analysis algorithm which autonomously identified fluorescently tagged antibodies and computed precise immunoreaction statistics, achieving a 97% accuracy in sensor-antigen interaction analysis.
- Played a pivotal role in creating a deep learning diagnostic algorithm for Lyme Disease detection. This involved data collection and management as well as feature selection strategies to assess antigen-specific binding levels, resulting in a rigorously tested algorithm with a specificity of 96.5% and sensitivity of 85.7%.

Biomedical Sciences Research Program, UCLA – Los Angeles, CA July 2016 - Sept 2016

Undergraduate Researcher

- Researched new Rifampicin gene mutations in E. coli, culminating in a well-received bioinformatics presentation about Irritable Bowel Syndrome (IBS) to a discerning panel of 10 faculty members. This project highlighted the integration of molecular biology and bioinformatics in addressing complex biological problems.
- Performed a detailed bioinformatic meta-analysis using genome-wide association studies (GWAS). This critical research focused on identifying specific genetic mutations.
- Demonstrated a high level of proficiency in essential laboratory techniques, including the use of agarose and acrylamide gel electrophoresis, and expertise in genetic cloning methodologies such as restriction digestion, ligation, and bacterial transformation.

Inorganic Chemical Sciences Laboratory, UCR – Riverside, CA June 2014 - Aug 2014

Research Intern

- Conducted cutting-edge research on carborane-based electrolyte solutions, aiming to enhance the electrochemical potential of contemporary lithium-ion batteries. This involved investigating alternative metal ions, including aluminum, and leveraging Excel for data analysis and interpretation.
- Spearheaded protocol optimization, successfully refining experimental procedures that resulted in a 30% increase in chemical yield. This initiative not only improved efficiency but also contributed to significant advancements in the laboratory's output.

- Executed and troubleshooted a series of complex experiments for the development of innovative electrolyte solutions. Techniques employed included rotary evaporation, recrystallization, chromatography, and Nuclear Magnetic Resonance (NMR) spectroscopy, demonstrating a high level of proficiency in laboratory practices.

Extracurricular Activities & Projects

3D4E, UCLA Aug 2016 - May 2017

As a member of the 3D printing club, I focused on collaborative group projects where members engage in designing, manufacturing, and testing various items using CAD software and 3D printers. The projects span a wide range, from creating recreational objects like chess pieces to more complex builds such as functional musical instruments and culminated in a project to create cheaper and more durable plastic joint components for para-athlete runners as those pieces fracture easily and are costly to replace.

Program for Excellence in Education and Research in the Sciences, UCLA Aug 2015- June 2017

Intensive program that is dedicated to fostering academic excellence and professional growth for students pursuing careers in STEM fields. It emphasizes student collaboration amongst underrepresented groups and encourages active participation in independent research projects, nurturing a strong foundation in STEM, and mentorship in coursework and university navigation for underclassmen.

Howard Hugh Medical Institute Research Program, UCLA Sept 2016 - Sept 2019

An interdisciplinary laboratory training program funded by the HHMI Professors Program, where my work as an undergraduate researcher was focused on computational biophotonics, imaging, and diagnostics for telemedicine and global health in the research lab of Dr. Ozcan and under the mentorship of Dr. Joung and Dr. Richards. I collaborated in projects led by postdoctoral scholars and senior graduate students, contributing to teams that innovated in new lab technologies. Contributed to several projects, in which I was listed as a coauthor on 4 publications (2 conference, 2 journal) in high impact venues for significant contributions to the studies. Additionally, the program emphasized independent research, presentation of findings in annual conferences, mentorship, journal clubs/literature reviews, and career development.

Marvelous Questions, LA Hacks - Los Angeles, CA May 2016

Partnered with a three-person team to integrate Microsoft LUIS machine learning software into a web application dedicated to asking questions about the Marvel Universe. The application was adept at interpreting and processing user queries and efficiently accessing relevant information from the Marvel Universe API. This implementation secured us a 2nd place among 10 competing teams in our category.

Recyclable, LA Hacks - Los Angeles, CA April 2017

Worked with a team of three to create an interactive website, integrating Google Cloud's Vision API for precise classification of recyclables. Our site offers a smart disposal recommendation system, customized according to users' geographic locations, thereby improving local recycling practices, and contributing to environmental sustainability.

Datafest, UCLA April 2018

In collaboration with a team of four, we analyzed millions of job searches spanning several years using R and Tableau. Our aim was to derive insights for innovative employment strategies. We established approximately an 81% correlation through multilinear regression between user engagement specific to local areas and industries. Additionally, we developed an optimized payout structure for advertisers based on their listing engagement, enhancing the effectiveness of job advertising.

Glutenin Gene and Celiac Disease Nov 2023

Conducted a comprehensive executive report by accessing and utilizing public databases to gather genetic sequences and then applying bioinformatics techniques for analysis. The project involved decoding genetic information to identify variants in the Glutenin gene that could influence the development of Celiac Disease using techniques such as multiple protein sequence alignment, primer design, calculating isoelectric point, and utilizing tools such as UCSC Genome browser, Python and R and their associated bioinformatics libraries (Biopython, Bioconductor, etc).

Generative AI in Protein Drug Development Dec 2023

Organized a comprehensive literature review on the use of AI and Generative Biology in protein drug development for a Pharmacology course, highlighting several projects currently being developed at Amgen. Elaborated on AI's acceleration of drug discovery, including specific examples like AI-driven identification of target proteins and computational modeling for drug efficacy. Covered the full drug development process from preclinical trials, citing AI's role in enhancing trial design and simulating immune responses, to market release. Emphasized AI's efficiency improvements in pharmaceuticals, discussing cost

reductions in drug testing and development, and highlighted future potential in personalized medicine and more inclusive healthcare systems.

Skin Deep: Exploring the Role of Ceramides in Protecting Against Environmental Aggressors Dec 2023

Executed a literature review for a biochemistry course on the role of ceramides in skin protection and specifically the mechanisms that allow for our protection of environmental aggressors. Studied their molecular structure, biochemical pathways, and response to environmental stressors. Explored their impact on skin health and potential dermatological applications.

Github Copilot Hackathon, Amgen - Los Angeles, CA Dec 2023

Cooperated in a team of 5 where I created a Python-based web application using Streamlit for predicting breast cancer likelihood. Integrated functionality to analyze CSV file data and generate predictions from new user inputs. Employed Github Copilot technology for rapid development in comparing individual data against population metrics and visualizing results. Received second place in popular vote award.

Technical Skills

Software Development: MATLAB, Excel, Tableau, CAD (Fusion360), Git/Gitlab, Linux/Unix, Databricks, Weka, AWS, Spark, Jira, Confluence, Slurm, PostgreSQL, Jenkins, Gitlab CICD, PyTest, Ansible, Terraform, Machine Learning, Deep Learning, NLP
Languages: Python, C++, SQL, PHP, R, HTML
Tools: matplotlib, seaborn, R Shiny, OpenCV, ggplot2, D3.js, CSS, pandas, scikit-learn, Scipy, Tensorflow, ChatGPT, Bard, Jasper.AI
Bioinformatics: BLAST, Clustal Omega/W, Bioconductor, DESeq2, UCSC Genome Browser, PyMOL, Bowtie, Biopython

Certifications & Training:

Certificate/Specializations	Issuer	Credential ID
Data Analytics	Google	QAE3QG5Y8CYN
Project Management Specialization	Google	23VT74ZK7J62
Advanced Machine Learning and Signal Processing	IBM	JVJQX7MZUQDQ
Certified SAFe® 5 Practitioner	Scaled Agile	https://t.ly/F7dvB
Certified SAFe® 5 Agile Software Engineer	IBM	https://t.ly/tTbww
AWS Certified Cloud Practitioner	AWS	https://t.ly/KCdfb
Databricks Lakehouse Fundamentals	Databricks	https://t.ly/BnJgC
Mathematics for Machine Learning and Data Science	DeepLearning.AI	https://t.ly/TaQhi
Database Engineer	Meta	https://t.ly/h-FnR
Data Engineer Associate	Databricks	In Progress (Exp Jan 2024)
AWS Solutions Architect Associate	AWS	In Progress (Exp Feb 2024)
Deep Learning	DeepLearning.AI	In Progress (Exp Feb 2024)
Data Science	Berkeley Extension	In Progress (Exp March 2024)

Publications

1. Joung HA, Ballard ZS, Wu J, Tseng DK, **Teshome H**, Zhang L, Horn EJ, Arnaboldi PM, Dattwyler RJ, Garner OB, Di Carlo D, Ozcan A. “Point-of-Care Serodiagnostic Test for Early-Stage Lyme Disease Using a Multiplexed Paper-Based Immunoassay and Machine Learning.” ACS Nano. 2020 Jan 28;14(1):229-240. doi: 10.1021/acsnano.9b08151. Epub 2019 Dec 18. PMID: 31849225.

2. Joung Hyou-Arm, Zachary S. Ballard, Alice Ma, Derek K. Tseng, **Hailemariam Teshome**, Spencer Burakowski, Omai B. Garner, Dino Di Carlo, and Aydogan Ozcan. "Paper-based multiplexed vertical flow assay for point-of-care testing." *Lab on a Chip* 19, no. 6 (2019): 1027-1034.

Conferences

1. Zachary Scott Ballard, Hyouarm Joung, Jing Wu, Derek Tseng, **Hailemariam Teshome**, Linghao Zhao, Elizabeth J. Horn, Raymond Dattwyler, Paul M. Arnaboldi, Omai Garner, Dino DiCarlo, Aydogan Ozcan, "Deep learning-based point-of-care diagnostic test for Lyme disease," Proc. SPIE 11469, Emerging Topics in Artificial Intelligence 2020, 114691I (20 August 2020);https://doi.org/10.1117/12.2567459

2. H. Joung, Z. S. Ballard, J. Wu, D. K. Tseng, **H. Teshome**, L. Zhang, R. J. Dattwyler, P. M. Arnaboldi, O. Garner, D. Di Carlo, and A. Ozcan, "Point-of-care test for early-stage Lyme disease using a multiplexed paper-based assay and machine learning,"

in *Biophotonics Congress: Biomedical Optics 2020 (Translational, Microscopy, OCT, OTS, BRAIN)*, OSA Technical Digest (Optica Publishing Group, 2020), paper TTh4B.5.

3. **Hailemariam Teshome**, Karina Nugroho, Carlos Zhang, Hyou-Arm Joung, Zachary S. Ballard, Derek K. Tseng, Spencer Burakowski, Omai Garner, Dino Di Carlo, Aydogan Ozcan, "Point-of-care test for early-stage Lyme disease using a multiplexed paper-based assay and machine learning, **[Poster, Oral, Demo]**" HHMI, NSF, & Koç Undergraduate Research Conference, (April 26, 2019)

4. **Hailemariam Teshome,** Alice Ma, Hyouarm Joung, Jing Wu, Derek Tseng, Linghao Zhao, Elizabeth J. Horn, Raymond Dattwyler, Paul M. Arnaboldi, Omai Garner, Dino DiCarlo, Aydogan Ozcan, "Multiplexed paper-based vertical flow assay for point-of-care Lyme diagnostics using a mobile-phone, **[Poster, Oral, Demo]**" HHMI Undergraduate Research, Training, and Innovation Program Day, (May 14, 2018)

5. **Hailemariam Teshome**, Kyle Liang, Michael Lo, Jeremie Richard, Steve Feng, DuckHa Hwang, Derek Tseng, Yingnan Wang, A. Ozcan, “Compact Semen Motility Analysis Device Based on Lensfree Holography, **[Poster, Oral, Demo]**” HHMI Undergraduate Research Conference, (May 24 2017)