Emily Chang

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Education

University of Virginia (UVA), Bachelor of Science in Computer Science, GPA: 3.99 2025

Minor in Applied Mathematics

Attending the 2024 Grace Hopper Conference on a trip fully-sponsored by Capital One

Teaching Experience

UVA Computer Science Department, Teaching Assistant *Jan 2024 - Present*

- Held office hours for Discrete Math and Machine Learning classes, serving a total of 893 students, and also assisted with grading exams and homework

UVA Applied Mathematics Department, Teaching Assistant *Jan 2022 - May 2023*

- Advised Probability (APMA 3100) professors and assisted 135 students with lecture material and code
- Created and lectured on course material that scaffolded student learning in class projects

New York City's Upperline Coding School, Teaching Assistant *Jun 2021 - Aug 2021*

- Instructed web design and data science classes, organized career panels, and tutored 60 middle and high school students

Research Experience

UVA Computer Science Department, Multilingual Embedding Space Researcher *May 2024 - Present*

- Advised by Professor Nada Basit
- Investigated how linguistic distance between languages affects the amount of data needed to perform transfer learning between multiple high resource language and a low resource language word embedding space
- Conducted supervised and unsupervised finetuning to develop Sentence Transformer models that can accurately perform the task Semantic Textual Similarity with low-resource languages

Virginia Space Grant Consortium, Machine Learning Researcher *Aug 2023 - Aug 2024*

- Advised by Professor Negin Alemazkoor
- Demonstrated how machine learning models can simulate HVAC Model Predictive Control systems built on Earth under lunar conditions
- Emphasized how calibrating these systems to the environmental conditions they are simulated in can conserve energy resources while maximizing thermal comfort

National Science Foundation, Natural Language Processing Intern *May 2023 - Aug 2023*

- Advised by Dr. Doug Downey
- Built a machine learning classification model designed to operate as a work automation tool and to assess whether the projects the NSF was funding met the goals set out in the CHIPS and Science Act
- Trained and finetuned the model on Web of Science and NSF abstracts until its responses were 20% more accurate than ChatGPT's
- Reccomended the federal agency to develop in-house models that were smaller, more cost-effective, and more secure than large language models

Carnegie Mellon University's Research Experience for Undergraduates in Software Engineering, Cybersecurity Intern *May 2022 - Aug 2023*

- Advised by Professor Hanan Hibshi and Dr. Maverick Woo
- Performed a statistical case study on broadband to understand how Internet access in rural counties fared during the COVID-19 pandemic
- Practiced open coding–a qualitative analysis technique–to examine interviews with women in cybersecurity and determine methods in which institutions and industries can make cybersecurity a more inclusive field
- Proposed recommendations to the National Security Agency and Egypt's Board of Education

Harvard College's Coronavirus Visualization Team, Project Lead *Mar 2020 - Jun 2021*

- Advised by Professor Kathleen Segerson
- Led an international team of 15 high school and college students to determine whether a COVID-19 environmental policy suspension resulted in greater pollution levels
- Designed a comparative case study and Bayesian Ridge Regression models to forecast pollution levels in Californian counties to conclude that the suspension resulted in greater levels of air pollution

UVA's Hydroinformatics Group, Progammer *Jun 2019 - Aug. 2019*

- Advised by Professor Jon Goodall
- Utilized the Stormwater Management Model to simulate a novel flood mitigation method that combatted rising sea levels in Norfolk, Virginia
- Project was awarded runner-up at the International Science and Engineering Fair

Industry Experience

Capital One, Small BUsiness Card Intern *Jun 2024 - Aug. 2024*

- Achieved significant cost savings by migrating two credit card alerts from third-party applications to company-run software infrastructure
- Implemented unit, local, quality assurance, and end-to-end software testing in Jest, AWS Kinesis Data Streams, and DynamoDB to ensure that the 21,000 people who receive these credit card alerts each day continue to do so post-code migration

Publications

- **Chang E**, Broadband Expansion: Disseminating Policy Lessons on COVID-19, *United Nation's Forum on Science, Technology, and Innovation*, 2023.
- Martorana A, **Chang E**, Hibshi H, Cuevas A, Investigating the Experiences of Female CTF Players, *Workshop on Security Information Workers*, 2023.
- **Chang E**, Zhang K, Paczkowski M, Kohler S, Ribeiro M, Association of temporary Environmental Protection Agency regulation suspension with industrial economic viability and local air quality in California, United States, *Environmental Sciences Europe*,2021.
- Liu Q, Liu W, Sha D, Kumar S, **Chang E**, et al. An Environmental Data Collection for COVID-19 Pandemic Research, *Data*, 2020.

Presentations

- Martorana A, **Chang E**, Hibshi H, Cuevas A, Investigating the Experiences of Female CTF Players, *Commonwealth Cyber Initiative*, Oral Presentation, 2024.
- **Chang E**, Alemazkoor N, A Methodology for Controlling Smart HVAC Systems in Planetary Environments, *Virginia Space Grant Consortium Student Research Conference*, Poster, 2024.
- **Chang E**, Gihlstorf C, Gregoire J, Endangered Languages—How much data do we need to model them well?, *Association for Computing Machinery Capital Region Celebration of Women in Computing*, Oral Presentation, 2024.
- **Chang E**, Considering Anthropogenic Factors in PM 2.5 Machine Learning Models, *Association for Computing Machinery Capital Region Celebration of Women in Computing*, Poster, 2024.

Awards

Society of Women Engineers: Liebherr Mining (Senior) Scholarship	May 2024
Best Connection/Connectivity Hack at the University of Virginia's Hack the Map competition	Feb 2024
UVA Engineering's Isabella Merrick Sampson Scholarship	Jun 2023
UVA Parents Program Gordon C. Burris Scholarship	May 2023
Virginia Space Grant Consortium's Undergraduate Research Scholarship	Apr 2023
UVA Engineering's Barbara B. Darden Endowed Scholarship	Jun 2022
Virginia Broadband Association Future Leader's Scholarship	Jun 2022
Virginia Space Grant Consortium STEM Bridge Scholarship	Apr 2022
Jefferson Scholar Foundation's Lettie Pate Whitehead Scholarship	Sep 2021
American Groundwater Trust Baroid Scholarship	Aug 2021
Exceptional voluntary service as a US Department of State Youth Program Alumni Outreach Ambassador	Aug 2020

Service

Volunteers with International Students, Staff, & Scholars, Classroom Assistant, ESL Assistant, Moderator *Sept 2023 - Present*

- Attended the research presentations of 46 international graduate students to provide feedback on improving their English and presentation skills

UVA Housing and Residence Life, Resident Advisor and Campus Security Authority *Jan 2023 - Present*

- Created programs emphasizing community engagement, diversity, and career development for over 122 students

UVA Transfer Guide, Testing Manager *Jan 2023 - May 2024*

- Practiced agile development in designing an app that allows students and faculty to search for courses transferable to UVA
- Led alpha and beta-testing, interviewed students and faculty as part of requirements elicitation, and developed student-side interface

Rodman Scholar Student Council, Research Co-chair *Sep 2021 - May 2022*

- Organized the Engineering Research and Design Symposium and raised $1,000 in event funding

Minerva's List, Co-Founder *Jun 2019 - Present*

- Developed a database where students can find scholarships that fit their academic and financial needs

State Department's TechGirls Program, Student Ambassador and Course Founder *Jun 2019 - Present*

- Engineered video games in Java, managed Unix operating systems, and promoted cultural education
- Designed a course on combating COVID-19 misinformation with data science and taught girls hailing from 13 countries

Skills

Languages	Python, R, Java, JavaScript, PHP, MATLAB, C, Assembly x86-64 SQL, English, Latin, Mandarin
Tools	Tensorflow, Git, Rivanna supercomputer, SLURM, JavaFX, JUnit, Metasploit, Nmap, Unix, Wireshark

Hobbies and Interests

- **Postcard collector** namely postcards from the New York Public Library and glow-in-the-dark postcards
- **Judy Blume and Stephen King reader** with *Summer Sisters* and novels with Holly Gibney in them being my favorites
- **Fan of standup comedy** and my favorite comedians are Ari Shaffir, Zoltan Kaszas, Chris Garcia, and Sam Morril