VENKATESH SIVARAMAN

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PROFILE

CMU PhD student in Human-Computer Interaction with experience in **human-AI interaction**, **machine learning for health**, and **data visualization**. Interested in designing and implementing useful, responsible AI tools for **decision-making** in collaboration with domain experts.

EDUCATION

Current Ph.D. student, Carnegie Mellon University

- Human-Computer Interaction
- *Advisor:* Adam Perer
- *Relevant coursework:* Human Judgment and Decision Making, Multimodal Machine Learning, Deep Reinforcement Learning

S.B., Massachusetts Institute of Technology (2020)

- Computer Science and Molecular Biology, Minor in Music
- *Final GPA:* 5.0
- *Relevant coursework:* Software Studio, Multimodal User Interfaces, Deep Learning in the Life Sciences

PUBLICATIONS

Conference Papers

1. **Sivaraman, V.**, Vaishampayan, A., Li, X., Buck, B.R., Ma, Z., Boyce, R.D., Perer, A. Tempo: Helping data scientists collaboratively specify predictive modeling tasks. To appear at *ACM CHI 2025*.

2. **Sivaraman, V.**, Li, Z., Perer, A. Divisi: Interactive search and visualization for scalable exploratory subgroup analysis. To appear at *ACM CHI 2025*.

3. **Sivaraman, V.**, Kwak, Y., Kuza, C., Yang, Q., Adamson, K., Suda, K., Tang, L., Gellad, W., Perer, A. Static algorithm, evolving epidemic: Understanding the potential of human-AI risk assessment to support regional overdose prevention. To appear at *ACM CSCW 2025*.

4. Boggust, A., **Sivaraman, V.** (*co-first authors*), Assogba, Y., Ren, D., Moritz, D., Hohman, F. Compress and Compare: Interactively evaluating efficiency and behavior across ML model compression experiments. Presented at *IEEE VIS 2024*.

5. **Sivaraman, V.**, Elavsky, F., Moritz, D., Perer, A. Counterpoint: Orchestrating large-scale custom animated visualizations. Presented at *IEEE VIS 2024*.

6. **Sivaraman, V.**, Bukowski, L., Levin, J., Kahn, J., Perer, A. Ignore, trust, or negotiate: Understanding clinician acceptance of AI-based treatment recommendations in health care. Presented at *ACM CHI 2023*.

7. Kawakami, A., **Sivaraman, V.** *(co-first authors)*, Stapleton, L., Cheng, H., Perer, A., Wu, S., Zhu, H., Holstein, K. (2022). "Why do I care what's similar?" Probing challenges in AI-assisted child welfare decision-making through worker-AI interface design concepts. Presented at *ACM DIS 2022*.

8. **Sivaraman, V.**, Wu, Y., & Perer, A. (2022). Emblaze: Illuminating machine learning representations through interactive comparison of embedding spaces. Presented at *ACM IUI 2022*.

9. Kawakami, A., **Sivaraman, V.**, Cheng, H., Stapleton, L., Cheng, Y., Qing, D., Perer, A., Wu, S., Zhu, H., & Holstein, K. (2022). Improving human-AI partnerships in child welfare: Understanding worker practices, challenges, and desires for algorithmic decision support. *ACM CHI 2022*.

10. Cheng, H., Stapleton, L., Kawakami, A., **Sivaraman, V.**, Cheng, Y., Qing, D., Perer, A., Holstein, K., Wu, S., Zhu, H. (2022). How child welfare workers reduce racial disparities in algorithmic decisions. *ACM CHI 2022*.

11. **Sivaraman, V.**, Yoon, D., & Mitros, P. (2016). Simplified audio production in asynchronous voice-based discussions. Presented at *ACM CHI 2016*.

Journal Papers

1. Swanson, S., **Sivaraman, V.**, Grigoryan, G., Keating, A. (2022). Tertiary motifs as building blocks for the design of protein-binding peptides. *Protein Science* 31(6).

2. Wu, J., **Sivaraman, V.**, Kumar, D. (*first three authors equal contribution*), Banda, J. M., & Sontag, D. (2021). Pulse of the pandemic: Iterative topic filtering for clinical information extraction from social media. *Journal of Biomedical Informatics*.

Workshops and Demos

1. Park, U., **Sivaraman, V.**, Perer, A. (2024). How Consistent are Clinicians? Evaluating the Predictability of Sepsis Disease Progression with Dynamics Models. *Time Series for Health Workshop at ICLR 2024*.

2. Newman-Griffis, D., **Sivaraman, V.**, Perer, A., Fosler-Lussier, E., & Hochheiser, H. (2021). TextEssence: A tool for interactive analysis of semantic shifts between corpora. *NAACL Systems Demonstration*.

INDUSTRY EXPERIENCE

Machine Learning Research Intern, Apple — Summer 2023
- Developed user-centered tools for machine learning model compression and evaluation, resulting in a publication at *IEEE VIS 2024*

Health Informatics Intern, Verily Life Sciences — Summer 2022
- Developed self-supervised deep learning approaches to characterize heart failure disease states from clinical notes

Software Engineering Intern, Verily Life Sciences — Summer 2019
- Worked on the Clinical Studies Platform Data Science team
- Designed and implemented an Apache Beam pipeline using both novel and existing NLP algorithms to process the ClinicalTrials.gov database

Software Engineering Intern, Apple — Summer 2017
- Developed software in Swift supporting the CarPlay, HomeKit, and MFi certification programs
- One of three projects selected to present to Apple VP of Product Integrity

Self-Employed, Base 12 Innovations — 2010 - 2020
- Developed seven iOS apps with over 750K total downloads, including a pioneering interactive geometry system (Isosceles) and the de-facto MIT course planning app (FireRoad) Additional Research Experience

ADDITIONAL RESEARCH EXPERIENCE

Keating Lab, MIT Biology Department — 2018 - 2020
- Advised by Prof. Amy Keating
- Built a flexible high-throughput Python pipeline to compute and predict protein binding affinities
- Developed a C++ toolkit for designing novel peptides, and an 3D visualization tool to render those peptides around a known protein
- Coauthor on two manuscripts pending submission

Structural Bioinformatics Lab, Pompeu Fabra University — Summer 2018
- Advised by Prof. Baldo Oliva
- Created machine learning models to predict mutation-induced changes in protein-protein and DNA-transcription factor interactions

Kloczkowski Lab, Nationwide Children's Hospital — 2014 - 2016

- Advised by Prof. Andrzej Kloczkowski
- Developed a novel algorithm to predict protein structure based on statistics of amino acid orientations

TEACHING EXPERIENCE

Final Project Advisor, Machine Learning for Healthcare, CMU (Fall 2024)

- Taught a lecture on human-centered ML in healthcare, led office hours and mentored students' final projects

Teaching Assistant, Programming Usable Interfaces, CMU (Fall 2022)

- Prepared and led a full semester of lab sessions and led office hours

Teaching Assistant, Interactive Data Science, CMU (Spring 2022)

- Prepared and led several interactive in-class labs and workshops, led office hours, and taught one lecture

Teaching Assistant, Fundamentals of Music Processing, MIT (Fall 2019)

- As the only TA for the class, led office hours, helped prepare lecture, lab, and homework materials, and taught one lecture

HONORS AND AWARDS

Graduate Research Fellowship, National Science Foundation (2022)

Fellowship in Digital Health, CMU Center for Machine Learning and Health (2022)

Merck Prize, MIT (2020)

- For research and academic performance in biophysical or bioinformatics sciences
- Awarded to one student in the MIT Biology department each year

Louis Sudler Prize in the Arts, MIT (2020)

- MIT Institute Award given annually to one graduating senior for music, theater, painting, sculpture, design, architecture, or film

SKILLS

- *Techniques:* Deep learning, data visualization, NLP, UI design, computer graphics, qualitative HCI methods, crowd-work studies
- *Programming languages:* Python, Swift, JavaScript (7+ years); Java, C++, C# (1+ years)
- *Tools:* PyTorch, TensorFlow, iOS/Android SDKs, Apache Beam, BigQuery, OpenGL, Vue, Svelte
- Advanced Spanish speaker
- Classical pianist