# Meera Krishnamoorthy

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## Summary

Ph.D. candidate in Computer Science at the University of Michigan. Experienced in developing accurate machine learning models under computational resource constraints (e.g., memory and time) and distribution shift (due to unstable relationships between features and outcomes or selection bias). Published in Nature Medicine, CHIL, and Nature Communications Biology. Skilled in designing novel ML methods for real-world applications in biology and healthcare.

## Education

**University of Michigan** *Sept 2019 – June 2025*
*Ph.D. in Computer Science* *(Expected)*

- GPA: 3.9/4.0
- Dissertation: Clinical Machine Learning under Computational Resource Constraints and Distribution Shift
- Thesis Committee: Jenna Wiens (advisor), Emily Mower Provost, Elizabeth Bondi-Kelly, Michael Sjoding

**California Institute of Technology** *Sept 2015 – June 2019*
*B.S. in Electrical Engineering, Minor in Computer Science*

- GPA: 3.7/4.0

## Awards and Fellowships

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|---|---|
| National Physical Science Consortium Fellowship | *2019* |
| Arthur E. Lamel Memorial Summer Undergraduate Research Fellowship | *2018* |
| SanPietro Travel Prize Recipient | *2018* |
| National Merit Scholar | *2015* |

## Technical Skills

**Machine Learning:** Supervised Learning, Multiple Instance Learning, Model Evaluation, Survival Analysis, Distribution Shift, Convolutional Neural Networks, Transformers

**Programming:** Python (PyTorch, scikit-learn, NumPy)

**Tools & Frameworks:** TensorFlow, SQL, Git

## Research and Work Experience

**University of Michigan** *Ann Arbor, MI*
*Graduate Student Research Assistant* *August 2019 – Present*

- Developed novel machine learning models for multiple input modalities (e.g., DNA sequences, images, tabular data), with numerous deep learning architectures (e.g., CNNs and transformers) and in several key subfields of machine learning (e.g., multiple instance learning, model selection, and survival analysis).
- Work has resulted in models that improved accuracy by up to 15%, enhanced memory efficiency by 14-18%, and increased speed by up to 10x compared to standard approaches.
- Work has been published in both clinical journals (Nature Communications Biology 2022; Nature Medicine 2024) and machine learning conferences (CHIL 2024).

**Duke Institute for Health Innovation (DIHI)** *Durham, NC*
*Research Analyst Intern* *June 2023 – Aug 2023*

- Developed multiple models to predict post-operative outcomes from invasive surgical procedures.

**California Institute of Technology** *Pasadena, CA*

*Summer Undergraduate Research Fellow* *June 2018 – Aug 2018*

- Mentored by Professor Yisong Yue.
- Explored using domain knowledge from control theory to develop a safe and accurate machine learning-based controller.

**Rocketship.vc** *Los Altos, CA*
*Software Engineering Intern* *June 2017 – Aug 2017*

- Created method to scrape and store information about startup investors and founders.
- Performed social network analysis to find trends among networks of successful venture personnel.

**NASA Jet Propulsion Laboratory** *Pasadena, CA*
*Summer Undergraduate Research Fellow* *June 2016 – Aug 2016*

- Mentored by Dr. Glenn Orton.
- Performed mathematical modeling and spectral analysis to identify nature of astronomical impact on Jupiter.

**Stanford University** *Pasadena, CA*
*Research Intern* *2013-2015*

- Mentored by Professor Shripad Tuljapurkar.
- Created mathematical models to simulate habitat degradation.

## Selected Publications

**Meera Krishnamoorthy**, Jenna Wiens. "Multiple Instance Learning with Absolute Position Information, " Conference Paper, Conference on Health, Inference, and Learning (CHIL), June 2024.

**Meera Krishnamoorthy**, Michael W. Sjoding, Jenna Wiens. "Off-label use of artificial intelligence models in healthcare, " Comment, Nature Medicine, March 2024.

**Meera Krishnamoorthy**, Piyush Ranjan, John R. Erb-Downward, Robert P. Dickson, Jenna Wiens. "AMAISE: a machine learning approach to index-free sequence enrichment," Journal Paper, Nature Communications Biology 5, Article Number 568, June 2022.

## Selected Presentations

**Meera Krishnamoorthy**, Jenna Wiens, "Improving the Memory Efficiency and Speed of Clinical Decision Support Tools," Oral Presentation, Greenhills Advanced Research Program: Summer Seminar Schedule Symposium, June 2024.

**Meera Krishnamoorthy**, Piyush Ranjan, John Erb-Downward, Robert Dickson, Jenna Wiens, "AMAISE: a machine learning approach to index-free sequence enrichment," Oral Presentation, University of Michigan's DCMB Tools & Technology Seminar, Feb. 2023.

**Meera Krishnamoorthy**, Piyush Ranjan, John Erb-Downward, Robert Dickson, Jenna Wiens, "AMAISE: a machine learning approach to index-free sequence enrichment," Poster Presentation, 10th Annual Kahn Symposium, Nov. 2022.
🏆 Honorable Mention Award 🏆

**Meera Krishnamoorthy**, Piyush Ranjan, John Erb-Downward, Robert Dickson, Jenna Wiens, "Machine Learning for Host Depletion of Metagenomic Data in Clinical Diagnostics," Poster Presentation, Machine Learning in Computational Biology (MLCB) 2021, Nov. 2021.

## Teaching Experience

**Artificial Intelligence for All (AI4All)** *Ann Arbor, MI*
*Instructor* *2020-2021*

- Developed and helped students with Natural Language Processing projects involving translation and pun generation (Summer 2020)
- Taught coursework on data visualization, feature processing, and k-means clustering (Summer 2021)

**California Institute of Technology** *Pasadena, CA*
*Undergraduate Teaching Assistant* *2018-2019*

- CS/CNS/EE 156a: Learning Systems (Fall 2018)
- CS/CNS/EE 155: Machine Learning and Data Mining (Winter 2019)
- CS/CNS/EE 156b: Learning Systems Project Course (Spring 2019)

## Professional/Academic Experience

**Michigan Science Center Coordinator** *2023 - present*

- Developing AI-related exhibit for the Michigan Science Center.

**Reviewer** *2021 - present*

- ML4H 2024, Research2Clinics NeurIPS Workshop 2021, MLHC 2022, ML4H 2022, MLHC 2023

**Ensemble of Computer Science Ladies (ECSEL+) Social Chair** *2021 - 2023*

- Planned social activities for members of ECSEL+

**Michigan AI Symposium Poster/Demo Session Co-chair** *2020*

- Helped advertise and organize the Michigan AI Symposium, a day of research talks, demos, and posters that brings together AI enthusiasts from industry and academia.

**Caltech Undergraduate Research Journal Co-editor in Chief** *2015 - 2019*

- Oversee editing and publication process of journal.

## Volunteer Work

**Caltech Robogals** *Pasadena, CA*
*Member* *2015-2019*

- Teach robotics workshops to 1st - 8th grade students.

**Caltech Society of Women Engineers** *Pasadena, CA*
*Member* *2015-2019*

- Mentor younger members about classes and internships.
- Volunteer in community outreach events.

**RISE Program** *Pasadena, CA*
*Tutor* *2015-2019*

- Tutor 8th - 12th grade students in various math and science courses.