

# Madeline Watts

PhD Student, Artificial Intelligence & Machine Learning

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## EDUCATION

- **Colorado State University** Fort Collins, Colorado  
*PhD in Computer Science* Jan 2023 - Expected May 2027
- **Colorado State University** Fort Collins, Colorado  
*B.S. in Computer Science; B.A. in Economics; Minor in Statistics* August 2018 - May 2022

## EXPERIENCE

- **Machine Learning and Computer Vision Laboratory** Fort Collins, CO  
*Research Assistant, PhD Student* November 2021 - Present
  - **Geometry of Learning:** Developing state-of-the-art adversarial attack defences using manifold learning, dimension estimation, and other mathematical tools
  - **Human Brain Inspired Machine Learning:** Creating machine learning models using FMRI data, utilizing Bayesian inference to make the model more generalizable
  - **Microgesture Dataset:** Creating the first public microgesture dataset, consisting of both synthetic and real data
- **Natural User Interaction Laboratory** Fort Collins, CO  
*Undergraduate Research Assistant* September 2020 - April 2022
  - **Gestural Interaction Techniques:** Research comparing microgestures and mid-air interaction techniques in augmented reality
  - **Biomass in Virtual Environment:** Analyzed data, produced statistical results, and contributed to paper examining the effects of biomass in virtual environments
  - **Immersive Analytics and Data Visualization:** Collaborated on a research project to better understand human interaction with immersive analytics in an augmented and virtual reality environment
- **Computer Science Department** Fort Collins, CO  
*Undergraduate Teaching Assistant* January 2020 - May 2022
  - **Java Teaching Assistant (CS 163/4):** Lead programming recitations, teach supplemental lectures, present live coding demos, and work with instructors to revamp the course
  - **Lead Teaching Assistant (CS 192):** Designed curriculum and created assignments, graded assignments, and oversaw operations with students and the other teaching assistants
- **Computer Science Department** Fort Collins, CO  
*Ambassador of Computer Science* October 2019 - August 2021
  - **Cultivated an inclusive and diverse environment:** Organized events for prospective and current students, collaborated with faculty, student volunteers, and department visitors, invited to speak about the importance of diversity in STEM fields at 20+ university events, and successfully hosted 16 Virtual Grace Hopper Viewing Parties (Oct '20)

## PROJECTS

- **Ethical AI Elicitation:** Collaborated with a team to compare human and intelligent systems responses to questions with high ethical implications (May '21)
- **"Hitchhiker" Ride Sharing Application:** Worked with a team to create a ride-share application for college students, implemented a Rest API, dockerfiles, and Kubernetes pod, and utilized Java, JavaScript, and Bash (Dec '20)
- **Intelligent Music Player:** Collaborated with a team of 4, utilized Python, Spotify's Developer API, Amazon Rekognition API, and Raspberry Pi to develop an application selects and plays songs corresponding to the user's emotion (May '20)
- **Coding Chat (Intelligent Immersive Classroom):** Utilized Unity, Blender, C#, and GitHub to create an interactive computer science classroom staffed with AI teaching agents in virtual reality (March '20)
- **Immersive Environments for the Aging Brain:** Collaborated with a team to develop a music-based virtual reality environment to restore cognitive function and long term memory in dementia and Alzheimer patients (Oct '19)

## SKILLS SUMMARY

- **Languages:** Python, R, Swift, SQL, Java, JavaScript, C, C#, C++, Bash
- **Frameworks:** NodeJS, React, ReactStrap, Bootstrap, Spark, PyTorch, NumPy, Tensorflow, Keras
- **Tools:** Kubernetes, Docker, GIT, MySQL, Unity
- **Other Skills:** Bayesian Statistics, Machine Learning, Computer Vision, Data Analysis, Regression Analysis

## HONORS AND AWARDS

- Grace Hopper Scholarship (Oct '19, '20, and '21)
- Awarded NSF Reset Scholarship (Feb '21)
- Industry Track Award at HackCU (Feb '20)
- Technical Award at RamReality (Oct '19)

## EXTRACURRICULAR EXPERIENCE

- **President of ACM-W** Fort Collins, CO  
*Reinvented organization for online format, tripled membership, expanded mentoring program* May 2020 - May 2021
- **Girls Who Code Curriculum Chair** Fort Collins, CO  
*Developed the current curriculum, lead Python workshops, mentored middle school students* Aug 2019 - Aug 2021