



SHELLER TEACHER EDUCATION PROGRAM
education arcade



Preparing High School Students for Careers in Machine Learning through Mentored Scientific Research

PIs: Weckel, M.; Lee, I.; and Gupta, P.

Co-authors: Moore, K.; Rabinowitz, G.; Strangas, M.; and Chaffee, R.

NSF Award Number: 2049022

Dates: 2021 - 2024

Project Overview: SRMPmachine innovates within the well-established Science Research Mentoring Program (SRMP) by creating opportunities for high school interns to apply machine learning (ML) to scientific problems in the natural sciences. We are measuring students knowledge and skill gains, and shifts in attitudes towards AI and career awareness.

Lessons Learned & Insights Gained

Year 1 (academic year '21) was a planning year focused on: 1) creating shared understanding of AI, ML, and the goals of SRMPmachine among stakeholders (project scientists, educators, SRMP alumni, and school partners); 2) elevating alumni voice and drawing on the expertise of our scientists in shaping a Summer Institute in ML; 3) recruiting a new SRMP cohort who participated in the Summer Institute in August 2022, and 4) building a concept inventory, and a survey of student attitudes and perceptions of AI. Both instruments include modified versions of validated instruments, as well as new items that have undergone cognitive interviews, expert review, and pilot studies.

Year 2 (academic year '22) commenced with the first run of the Summer Institute. Sixty students participated in the institute and 37 students took the surveys and completed the exit tickets. Analysis of results is underway.

Equity

With the goal of designing a justice-centered curriculum, we worked with Dr. Angela Calabrese Barton (SRMPmachine advisor) and Dr. Day Greenberg to bring their findings from the YESTEM (NSF award #1647033) project to SRMPmachine. YESTEM has created resources and tools to support educators in providing more equitable and just informal learning experiences. Specifically, we focused on the core equitable principles of shifting narratives, recognizing, co-designing, and authority sharing. In the spirit of co-designing and authority sharing, we recruited an alumni board to advise on the creation of the new Summer Institute

New Challenges & Next Steps

In Year 2, we will be supporting and following 15 students who completed the Summer Institute in ML, and have been placed in the labs of scientists using ML in their research. We will investigate the impact of mentored-research on ML knowledge, skills, and attitudes. With our SRMP alumni, we will 1) revisit the Summer Institute curriculum drawing on feedback from staff, students, alumni, and early research findings, and 2) develop workshops focused on ML/AI careers.