The field of socially assistive robotics aims to create robots that can engage with users through meaningful social interactions in order to provide non-physical, cognitive assistance [1]. In the Interaction Lab I worked with my labmate Luke and our mentor, Professor Matarić's Ph.D student, Brandon Thai Tran. With the help of our mentor, we wrote code to find faces via bounding boxes, perform facial landmark detection, train and run a machine learning model that detects human emotion based on the user’s facial expressions, then displays the emotion on the video feed.

I worked on writing a program and training a machine learning model to analyze visual data from live webcam data. The model would detect and identify a user's emotions in real-time based on facial landmarks. Through this research and the SHINE program, I practiced my programming skills through Python and MATLAB, learned to manage a coding environment through Poetry, developed clean coding practices, learned to effectively read a research paper, and used the terminal for the first time. I also gained experience using many Python packages like Pytorch, OpenCv, and Numpy. Additionally, I studied machine learning, SARs, and discovered what it means to be an HRI researcher. I also learned to utilize and navigate JupyterLab, Github, and Google Colab.

I was able to relate the work we did in JupyterLab and with Python to my AP Computer Science classes where we learned the basis of computational thinking and coding. I am excited to bring back what I learned this summer working with machine learning and coding to my Advanced Topics in Computer Science class this year. This program will give me a boost in any of my future STEM courses and in my future as I continue on my journey in STEM.

My STEM Coursework

![code snippet](https://news.cornell.edu/stories/2019/05/soft-social-robot-brings-coziness-home-robotics)

**Figure 2:** JupyterLab logo
**Figure 3:** Pytorch, a machine learning framework
**Figure 4:** Github logo

**Figure 5:** A snippet of code from JupyterLab. This function turns each video frame gray to allow the program to detect a face more easily and draw a bounding box around each face as well as find facial landmarks and draw them on the frame before displaying it to the user.

PC: Alondra Cardenas

My advice to future students is to take advantage of the opportunities offered by SHINE as the 7 weeks go by very quickly. Do not be afraid to communicate and ask for help from your mentors. SHINE is an opportunity to further yourself in STEM, explore your interests, and meet other people who are passionate about STEM and research. It is also okay to use SHINE as an opportunity to figure out what you do and do not like and what careers you may or may not want to pursue. Overall, I would say the most important thing is to take advantage of the opportunities provided, make use of available resources, and have fun!

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