Description of Research:
This past summer, working at the Air Force Research Laboratory's (AFRL) most cutting-edge facility: The Gaming research integration for the Learning laboratory (GRILL), I gained immense hands-on experience in training simulation research. I worked with customers from Calmityville, a military training facility for special forces and first responders, to create a Live Virtual Construct (LVC) training simulation, which integrates real and virtual assets to enhance training, testing, and research. I used Unreal Engine 4, Python, cybersecurity networking, and Raspberry Pi sensor integration to devise a new method of virtual reality (VR), which is denoted as mixed reality, for our customers at Calamityville. This means that if an item in real life is repositioned, the object will also appear to move in a VR simulation setting.

Contributions to project:
My role in this project, as a research scholar, was to interface the Raspberry Pi module and the Vive trackers to Unreal Engine 4 so that they would allow for the sending and receiving of DIS data through the network. DIS is an IEEE standard and network protocol. It works by sending marked data up to the network with a unique entity ID. Then other computers that are running the simulation will retrieve this marked data by looking at the data's unique ID. DIS is a popular simulation networking protocol that is used in the game design industry mainly for its features of allowing for multiplayer interactive simulations where multiple users can be in the same simulation. This data was obtained from the Vive tracker and for the Raspberry Pi, the data was acquired by using sensors that obtained GPS, Acceleration, Orientation, Magnetic Flux Field, and Temperature data. All of this data was then coded to be packaged up and sent to Unreal engine where this data would be used to constantly update the telemetry data regarding the RPG.

What I learned about the research process:
I have learned a significant amount about the research process and how research is actually just trying new things and seeing if your perspective on something can make an impact on the current industry. I want to dive deeper and explore more possibilities while working with this proprietary technology because I realized that it allows for endless possibilities due to its high level of customization with training, and I was at the forefront of conceiving it. After this research experience, I have realized that my research interests do not align with a certain major or field because CS has such a wide variety of applications to many fields whether that be medicine, aerospace, or even linguistics. Therefore, I would like to conduct research in many different fields that use CS so that I can contribute to that research while enhancing my skills.