ARAID: A Novel Real-Time Augmented Reality and Artificial Intelligence Driven Navigation System & Surgical Pipeline for Cardiovascular Surgery

Gurram, Abhinav (School: Green Hope High School)
Sud, Ethan (School: Green Hope High School)

Cardiovascular surgery is a complex and high-risk procedure that requires precise navigation to ensure the success of the operation. In recent years, there has been growing interest in the development of real-time navigation systems that can assist surgeons in navigating within the patient's body during surgery. These systems often use machine learning and augmented reality (AR) technologies to provide real-time guidance and visualizations to the surgeon. ARAID is a real-time navigation system for cardiovascular surgery that utilizes machine learning and AR to guide surgeons during the procedure. The system is able to analyze data from various sources, such as medical imaging and surgical instruments, to provide accurate and up-to-date guidance to the surgeon. The use of AR allows the surgeon to see virtual overlays on top of the patient's body, providing a clear visual representation of the surgical plan and helping to reduce the risk of errors. Additionally, the tool includes an algorithm that analyzes the surgical video in real-time, tracking the actions of each surgical instrument and alerting the surgeon if any discrepancies are detected. This feature helps to improve the accuracy and safety of the surgery, as the surgeon is able to immediately address any potential issues. Results from initial testing show promising accuracy and usability of the system, suggesting that it has the potential to significantly improve the safety and efficiency of cardiovascular surgery. Overall, this surgical tool has the potential to revolutionize the way surgeries are performed, improving outcomes and increasing patient safety.

Awards Won:
Third Award of $1,000