Approximately 45% of the global population lives in rural and remote areas, but only 38% of nurses and a quarter of doctors work in these areas, creating a major threat to healthcare provision. The traditional model of ambulatory care is unreliable in rural areas, leading to preventable deaths from health-related issues. I chose this problem because I used to live in southern Georgia with my older brother, and he died from sickle cell anemia. If he had the access to resources that other people did while living in the city, he might have been able to seek preventable care and receive the treatment he deserved. My solution to this problem is to create a low-cost, last-mile healthcare delivery model that detects symptoms early and guides patients to a nearby point of care, using machine learning and simple, easily operable medical instruments.

One way to accomplish this is by leveraging the advancements in machine learning, specifically convolutional neural networks (CNNs), which have been shown to outperform human observers in diagnostic radiology in areas such as tumor developments and CAT scan abnormalities. These radiograph models can be effectively trained using CNN algorithms and quickly deployed in remote locations at a cheaper cost than modern medical devices. Furthermore, many radiography datasets already exist on platforms like Kaggle, which can be used to build a neural network without starting from scratch. The use of convolutional neural networks in diagnostic radiology have been shown to be an effective solution by training these models on existing datasets and deploying them in remote locations at a cheaper cost than modern medical devices. In addition to CNNs, the use of Long Short-Term Memory (LSTM) could also be beneficial. LSTMs, which are a type of recurring neural network (RNN), can effectively handle sequential data, such as time-series data from medical monitoring devices, which can be utilized to prevent potential chronic illnesses by keeping track of the patient's health over time.

However, there is a major hurdle when it comes to the ease of access to technology in rural areas. Many rural areas do not have access to the internet to retrieve these data sets nor the technology to host the software behind these CNNs and LSTMs. But there are ways to overcome this, like Microsoft's Project FarmVibes, which calls for the deployment of "white spaces"—inexpensive routers that provide satellite internet. By deploying these white spaces and cheap ML medical instruments in rural areas, healthcare facilities everywhere could conduct cheap diagnostic checks at the local level, improving accessibility of healthcare for people in rural and remote areas.

In conclusion, the shortage of healthcare professionals in rural areas is a major societal problem that needs to be addressed. By implementing my solution, we can improve accessibility of healthcare for people in rural and remote areas across the United States. It is also important to address the infrastructure and technology barriers in deploying this solution, which can be remedied by satellite internet infrastructure such as Microsoft's Project FarmVibes to remote areas.