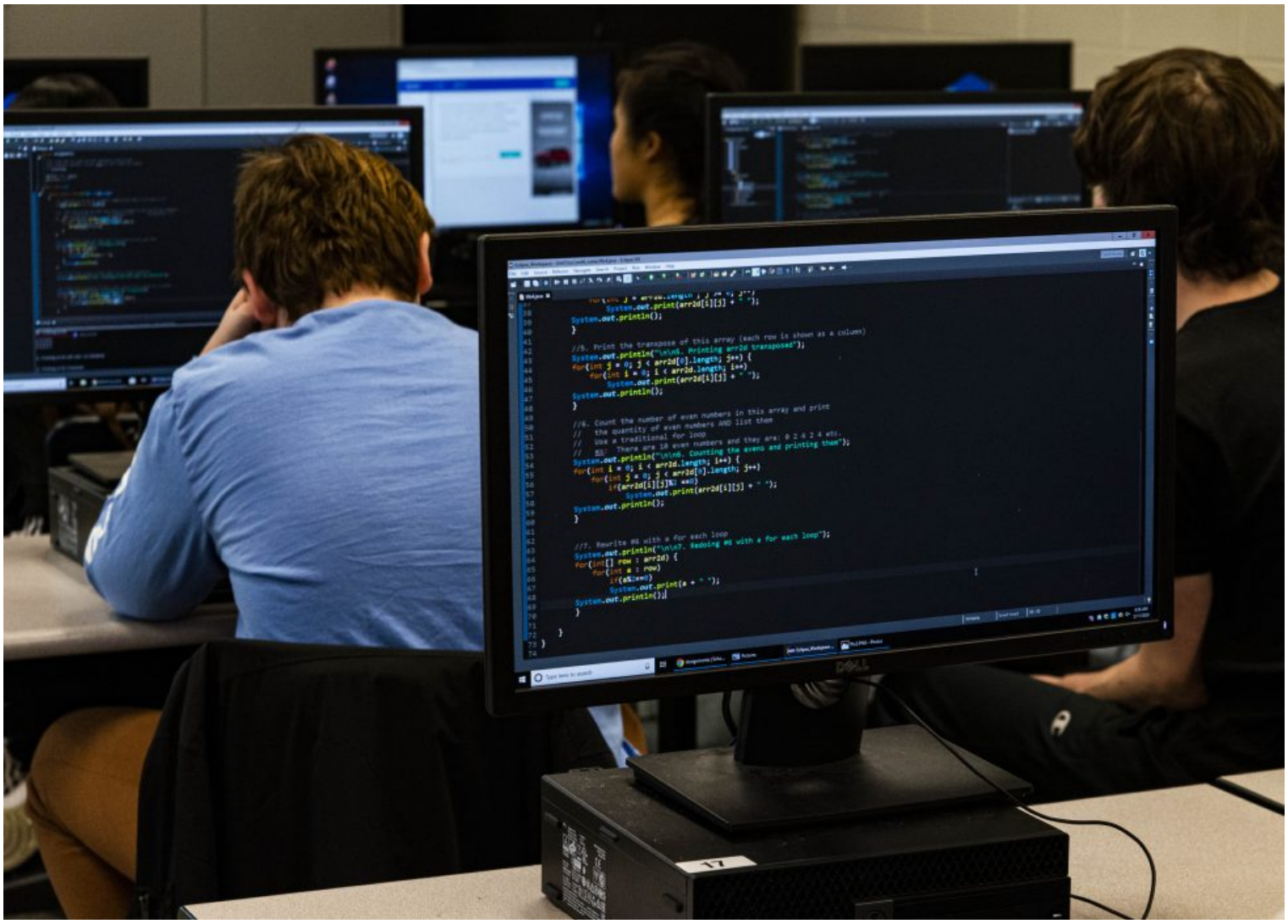
D211 POST: FREMD HS STUDENTS DESIGN APPS TO HELP SAVE LIVES



A pair of students at William Fremd High School have designed seperate mobile apps that will each benefit the health and safety of their communities, and possibly the world, in their own unique ways. Senior Kevin Han has found a way to make work a little easier for area emergency services, while junior Pavan Pandurangi has developed a tool for making malaria detection easier for impoverished areas around the world.

Fremd High School Senior Kevin Han.

For Han, production of his app began as an independent study assignment.

“I started in computer science making games, which was fun,” Han said. “But I wanted to ultimately make something that could benefit the community.”

After speaking with Mathematics Teacher Shannon Denna, who had multiple connections with area fire departments, Han decided building an app for the Northwest Community Emergency Services System (NWC EMSS) was the direction he wanted to pursue. Han said that each fire department within the system carried a large manual of more than 100 pages containing all standard operating procedures. In an emergency, first responders would have to periodically reference the manual, searching the index for their specific need and then finding those pages.

Han’s app allows users to access key items in in the procedure manual through quick interactive menus and search options. Han added that his app operates even in off-line situations.

In developing his app, Han worked closely with area firefighters as well as the NWC EMSS medical director, Dr. Matthew Jordan. Dr. Jordan said that Han’s app has been used successfully with an increasing number of agencies since its development.

“We have more than 40 area fire departments using his app,” commented Jordan. “We have been very pleased with it.”

Han said knowing his app is in use by so many firefighters and emergency medical technicians is a good feeling.

“It feels good knowing I’ve had a legitimate impact on the community,” he said. “It feels a little different now whenever I see an ambulance drive by.”

Across the classroom from Han, junior Pavan Pandurangi was working on developing his own application programing interface (API) to help impoverished nations deal with a deep medical issue, detecting and combating the spread of malaria.

Pandurangi said that originally he wanted to build an API that would work with detection of other illnesses.

“Initially, I was looking into diseases like breast cancer,” he said, “but I found that most people with breast cancer live in areas where it is easily diagnosable. Malaria originates in places where it is harder to diagnose because you need people with experience in microscopy.”

Fremd Junior Pavan Pandurangi.

Pandurangi said that expertise is something that is not as available in impoverished areas such as in India and Africa where malaria is more prevalent. Following this change, he began working with a multiple medical professionals, including Dr. Veena Mane in India. Pandurangi said Dr. Mane helped teach him the process of observing and diagnosing malaria in blood samples.

The plan for the API, according to Pandurangi, is that doctors can place a blood sample under a microscope and connect a mobile device, such as a phone, to the camera of the microscope.

“Once the doctor gets a number of samples, we can run them through the API which would return the positive or negative results for the patient,” Pandurangi said. “It will also give us the parasite density as well as identify stage and species of the parasite.”

Pandurangi added that his API would use a convolutional neural network (CNN) that would allow it to learn and adjust through repeated use.

“What I am doing is training these networks to detect the trends to determine what makes the images positive or negative for malaria,” he said. “It will look at each individual cell and diagnose it as healthy or infected.”

He added that even after its initial development, the API will be constantly adjusting with each blood sample scanned.

Dr. Mane said Pandurangi’s app can help in education about malaria as well.

“[Pandurangi’s App] can help more and more people be informed and educated about the disease,” she said. “Any information about communicable diseases, especially parasites in the blood which may cause death, is a great help to society.”

Denna said that she is impressed by the work and diligence of her students.

“In the time I have been working in computer science, I don’t think I have worked with anyone as gifted as the two of them,” she said. “What is most impressive is that they are looking for ways to create new solutions outside of what they have been taught.”

She added that the students desire to work on projects that will help others says a lot about their selflessness.

“I think this work shows that your age doesn’t determine how much of a difference you can make,” she said. “It shows that looking at something outside of yourself, can have lifelong results.”