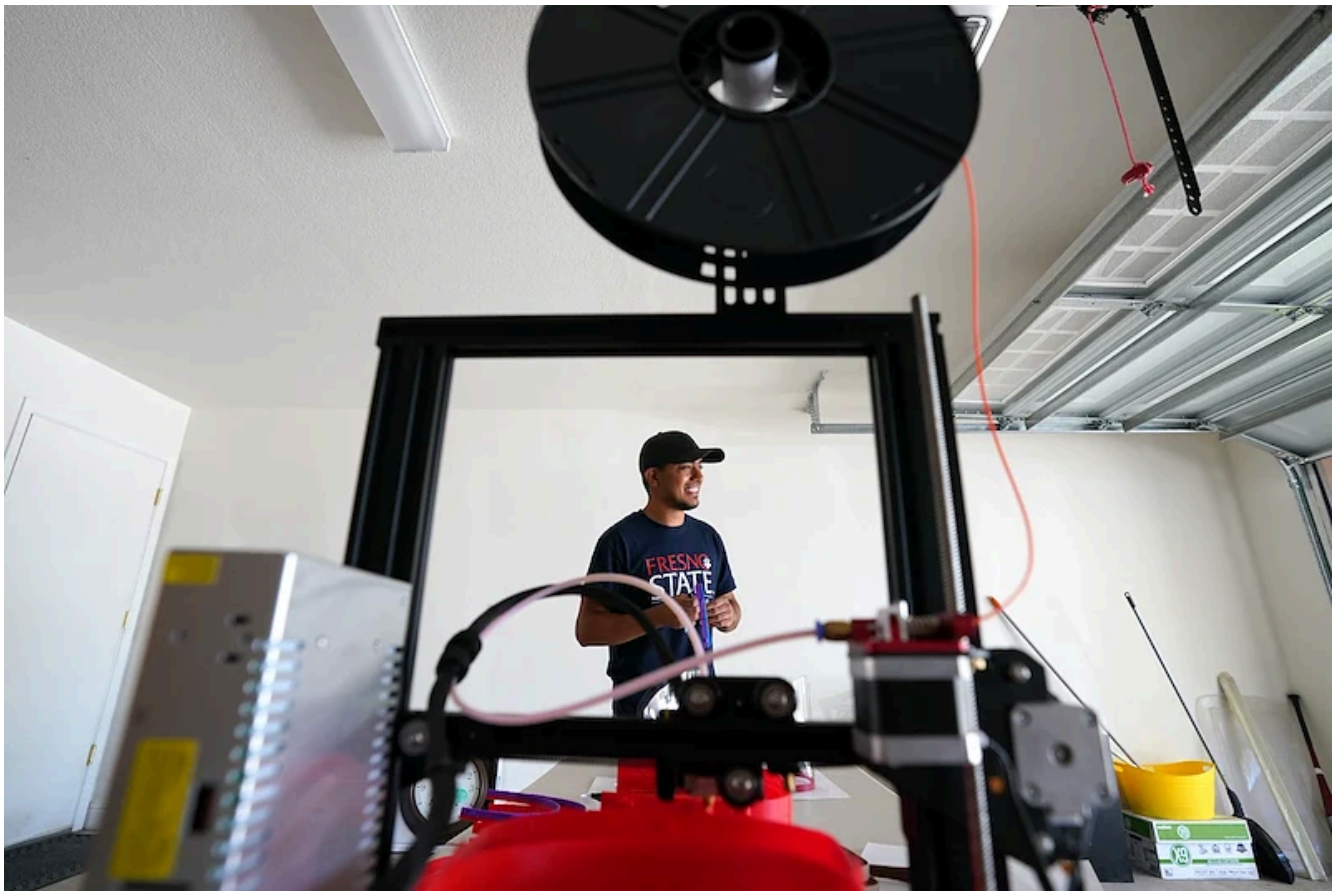
EXPOSURE



INSPIRING INNOVATION

How an engineering student used 3D printing to help health care workers

Story by Fresno State

September 2nd, 2020

Initially, he thought 3D printing was something engineers did for fun during their leisure time, but as the effects of COVID-19 began to impact local health care workers, mechanical engineering student Mandeep Singh soon learned that 3D printing could be used to help fight the pandemic directly.

Although many community members were working to meet the growing need for personal protective equipment during the first few months of the pandemic — often donating

branch of the UC San Francisco School of Medicine housed within Community Regional Medical Center in downtown Fresno, were looking to partner with local innovators who could design and manufacture protective face shields tailored to accommodate existing medical materials.

Mandeep, along with other students and faculty from Fresno State's Lyles College of Engineering, was eager to meet this challenge. In early March, the team began working closely with the doctors to create custom face shields, adjusting the design accordingly as health care workers tested out prototypes.

Looking ahead to production, Mandeep began sourcing materials that would eventually be transformed into shields using Fresno State's supply of 3D printers. Once the design was finalized, the team gathered 3D printers from across campus to maximize their production scale.

> "It really opened my eyes towards 3D printing, this project, because I never really thought it could be used towards making PPE," Mandeep says.

"It helped me understand that 3D printing is something that we can really utilize in the biomedical area."

To maximize efficiency and maintain physical distancing, Mandeep and his peers continue to work in shifts to restock the printers that produce the shield's base, cut the plastic sheets that serve as the protective guard and assemble the parts that make up the final product.

This project has not only shown Mandeep the versatility of engineering but also the importance of working together to solve collective problems.

> "We all have to collaborate, work together, try to be there for each other especially during such uncertain times," he says.

"Even through our smallest gestures, we can spread positivity, and help reassure our faith in humanity."

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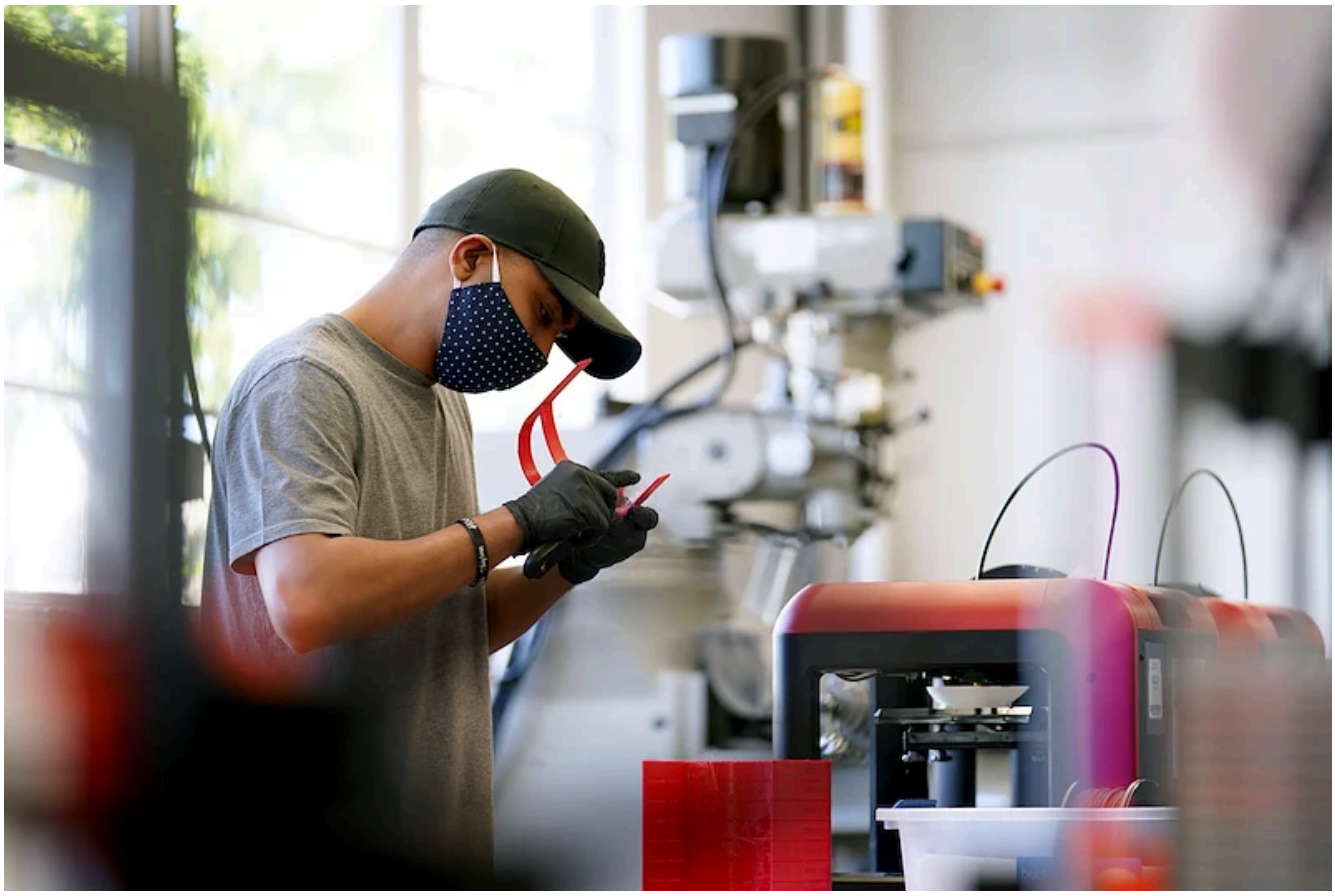

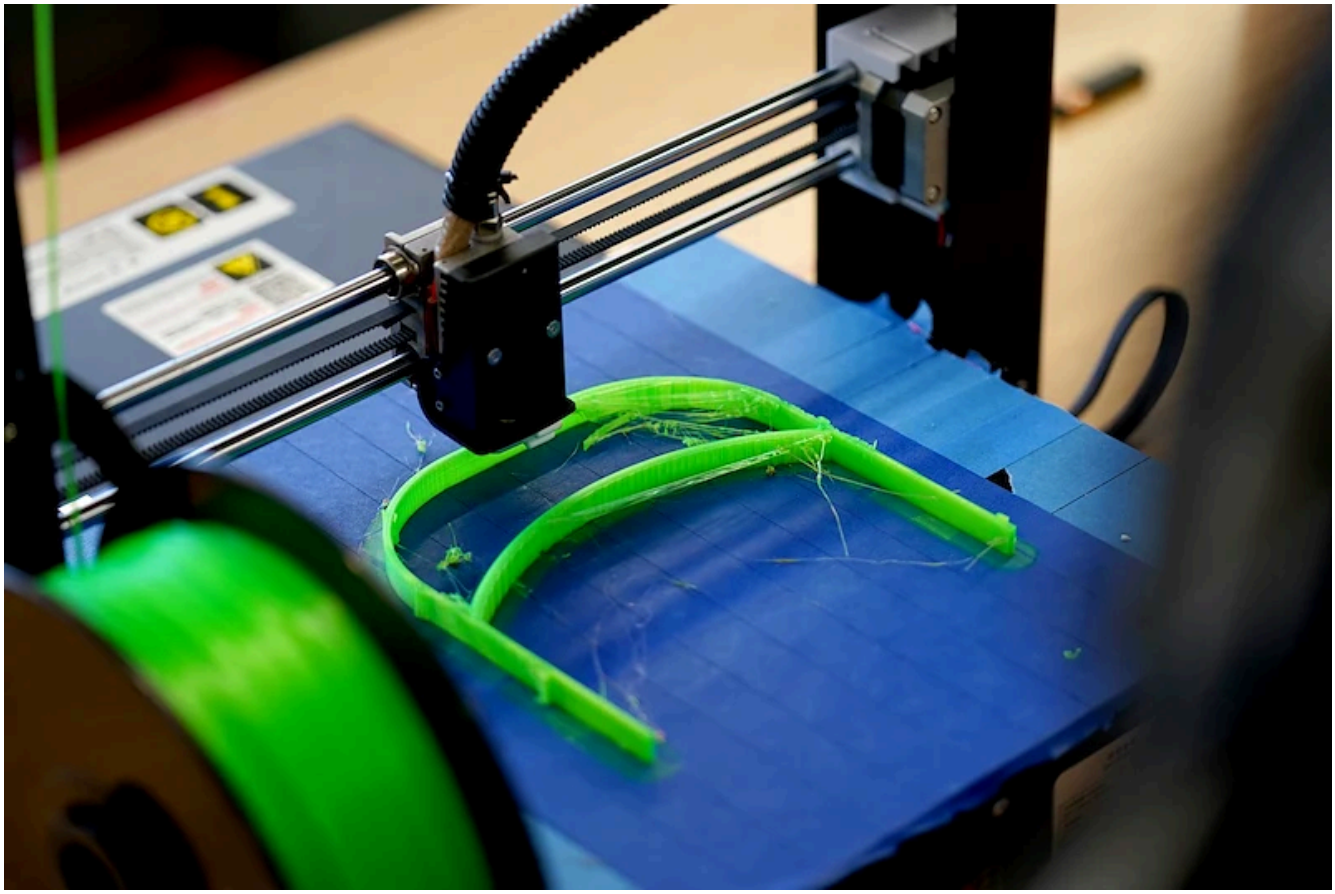

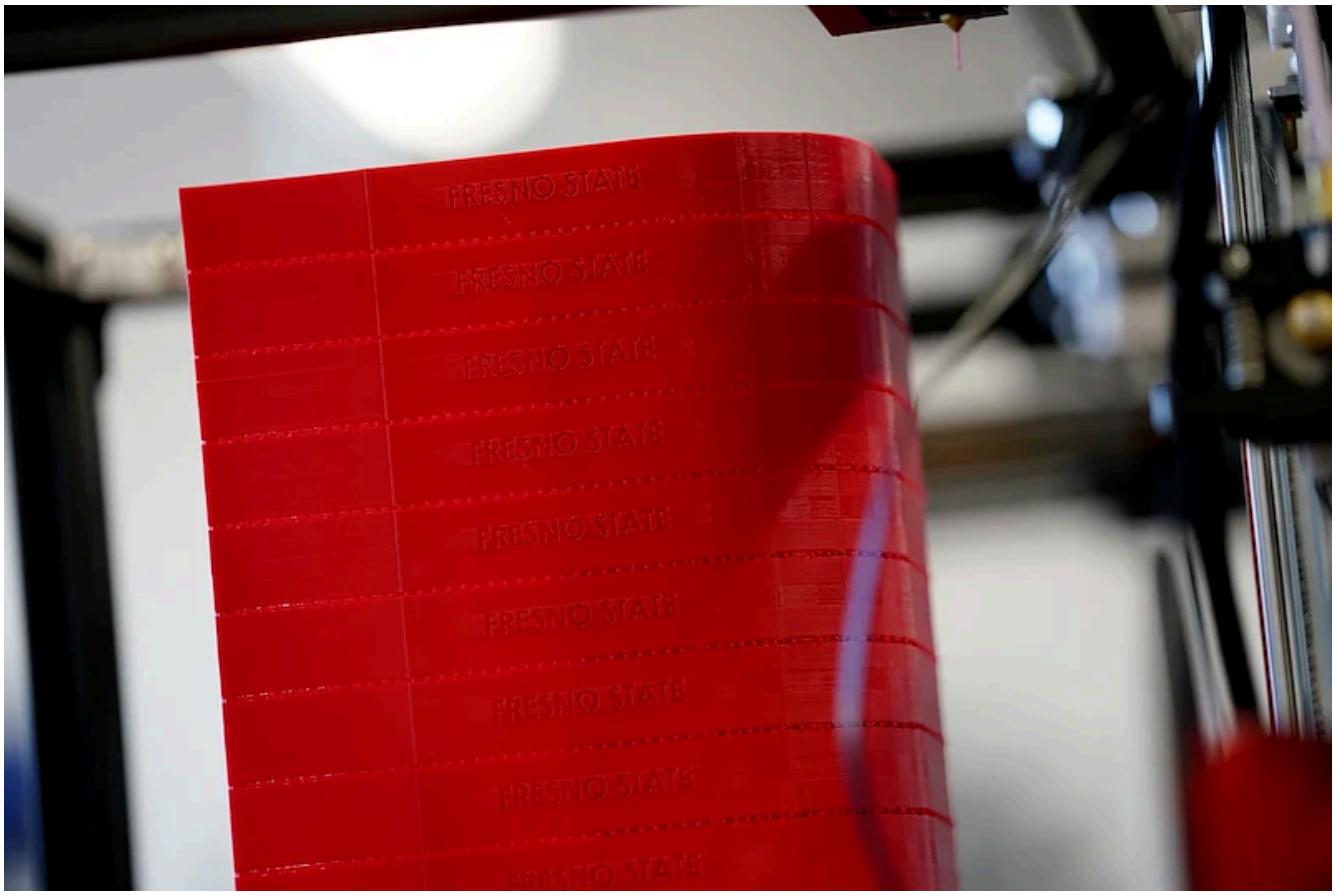

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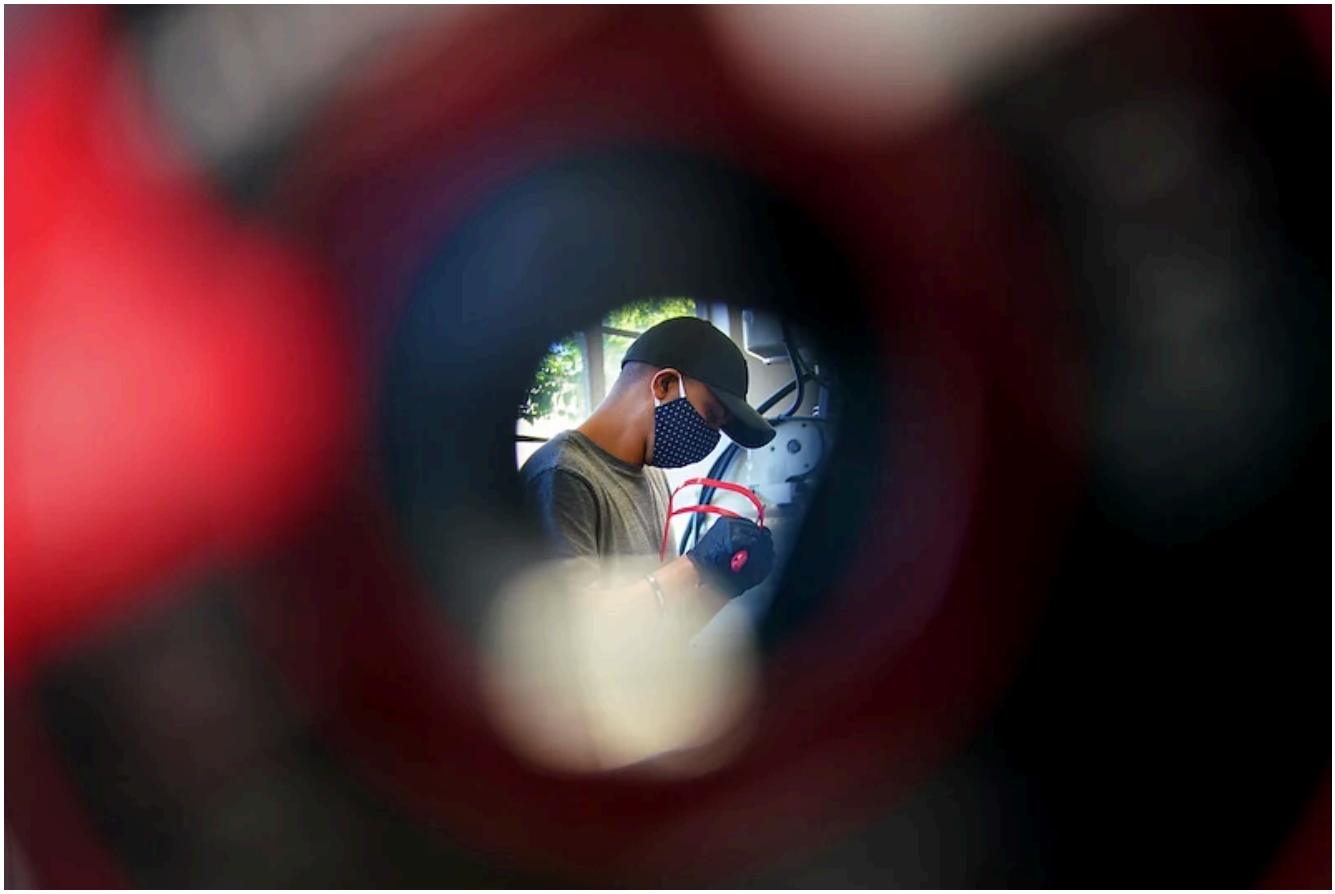
In early April, the team donated its first batch of shields to doctors and other health care providers at Community Regional Medical Center and other local medical facilities. Currently, Mandeep and his peers are working to produce another 500 shields, which will also be donated to Community Regional as well as reserved for some of Fresno State's in-person fall courses.



HANDS-ON LEARNING

After seeing the impact this project has had on the community, Mandeep recognizes the importance of technology and the role engineers can play to help alleviate the public health crisis.

"I think it's really important for us to understand that technology is a big part of our life right now," he says. "I'm not a doctor, so I can't really help patients firsthand, but at that point, technology comes in. I can use the engineering skills that I have learned and apply it towards helping people in whichever way I can."

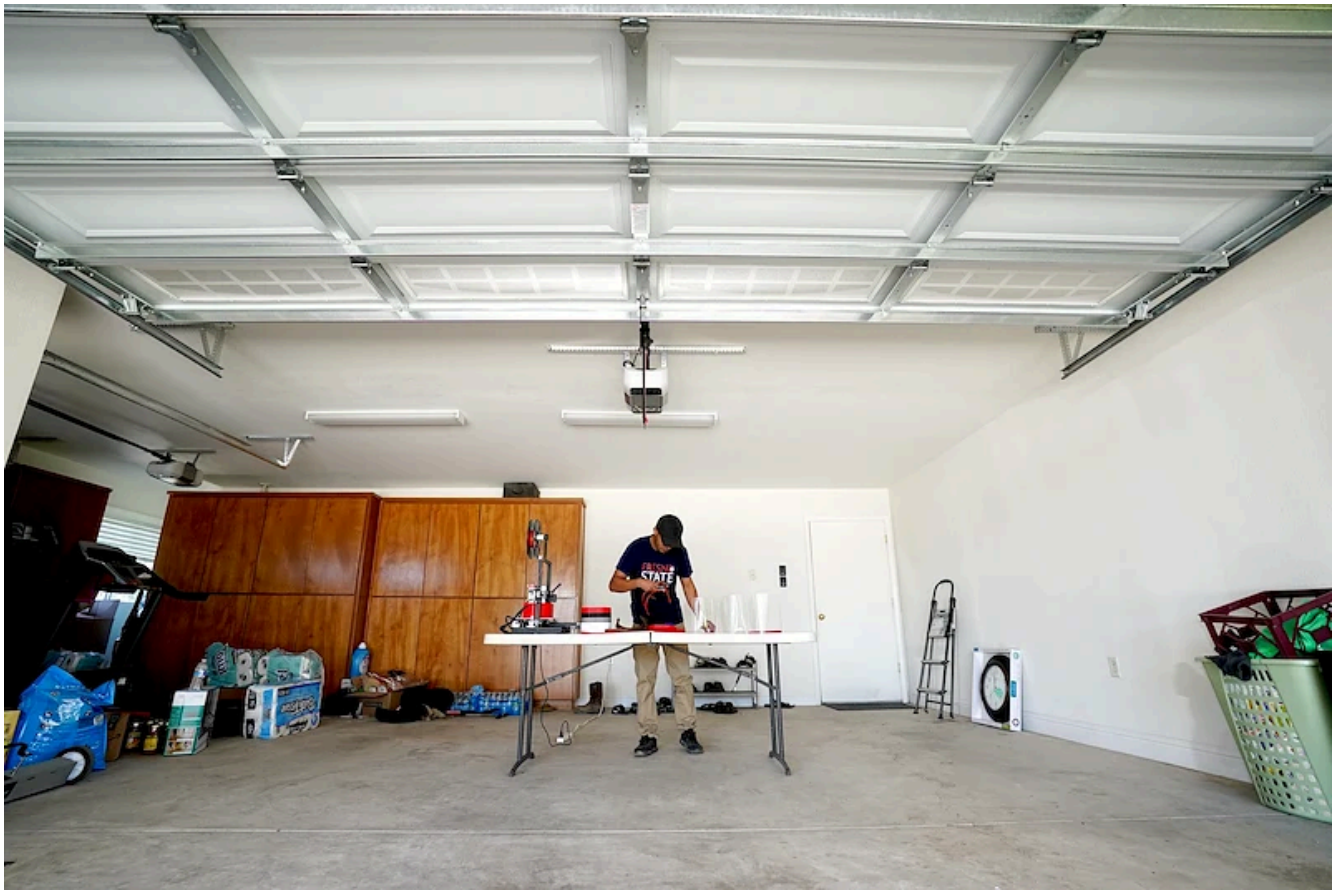
In addition to providing direct relief to local health care workers, this project has given students like Mandeep an invaluable hands-on learning experience outside of the classroom.

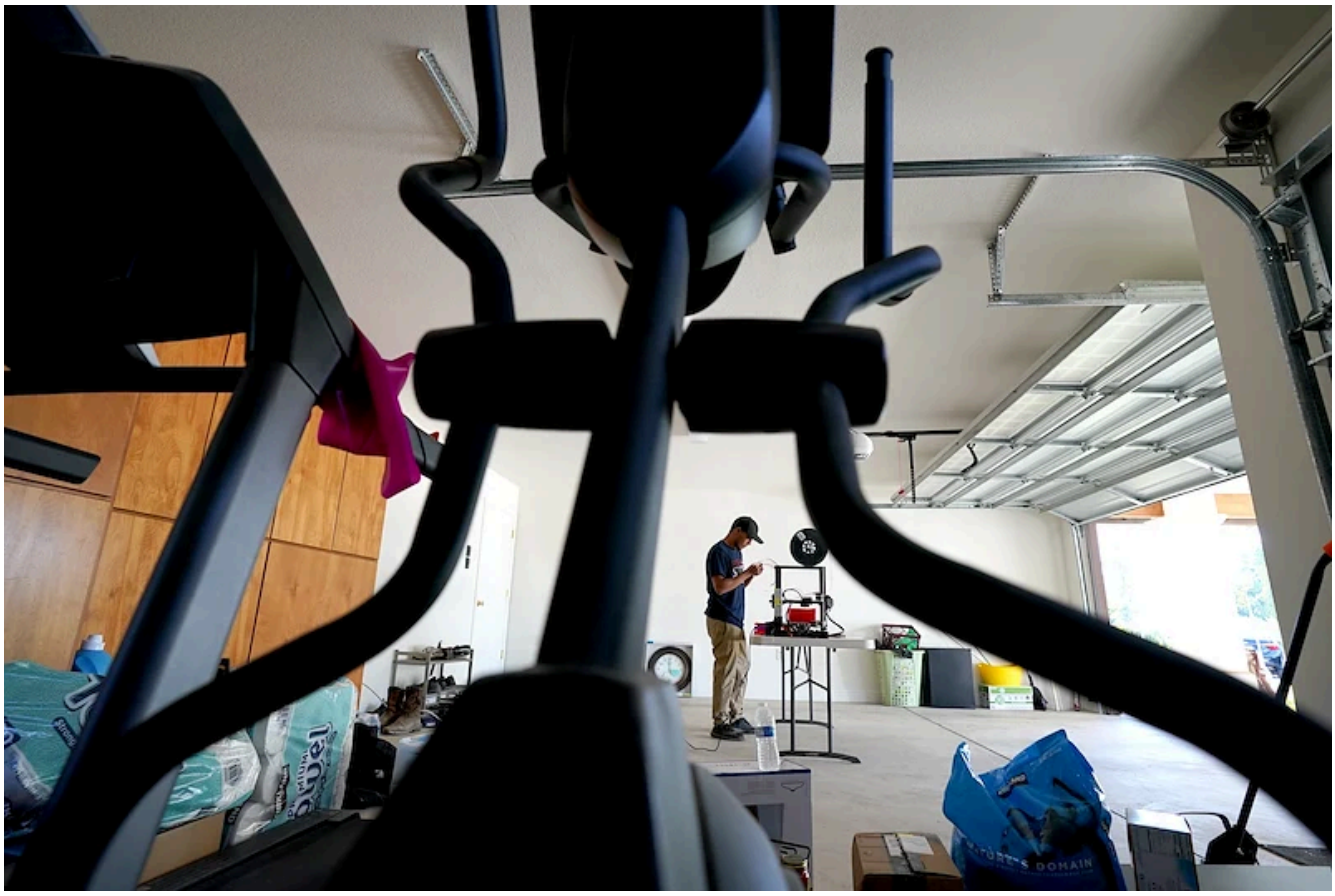
> “If you get these hands-on experiences, it teaches you not only technical skills but soft skills like communication, working in a team, collaborating with other people, just things that are not necessarily that easy to learn in a book,” he says.

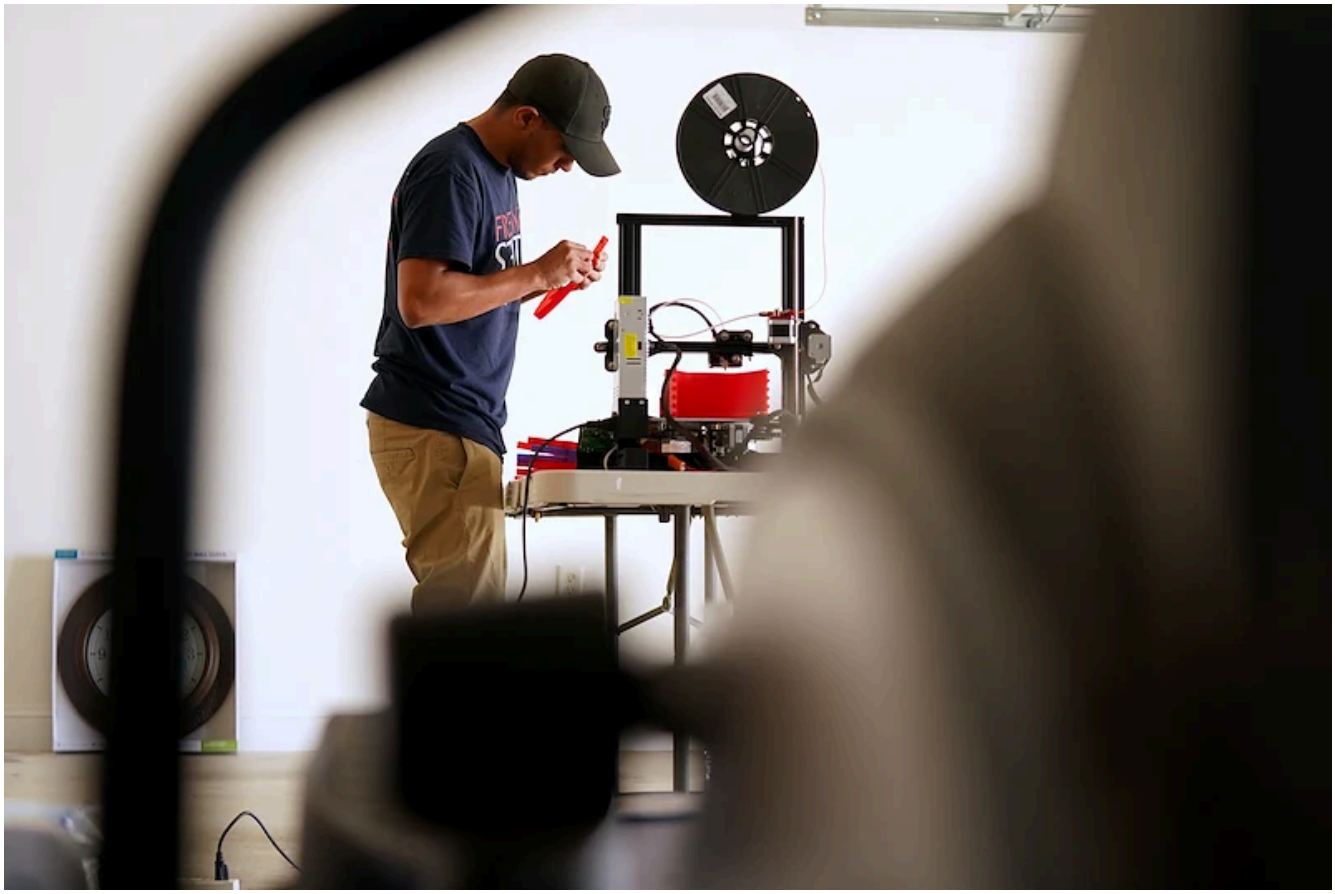
Gaining hands-on experience alongside his professors, whose careers in engineering have been especially inspiring, is also one of the highlights of this project for Mandeep.

“Just seeing their work ethic, how they adapt their research based on changes happening in the scientific world, it gives you a perspective of how research works in the real world,” he says. “Their work has always inspired me to take up a career in research, as it has made me understand the impact it can have on the society.”

Mandeep’s curiosity and passion for discovery have been evident through his involvement in this project and others, including previous research on water purification and nanomaterial applications. With a desire to learn more, Mandeep plans to continue his education as an engineer and ultimately pursue a Ph.D.







AN EVERYDAY COMMITMENT

Growing up in India, where access to technology was not as abundant, Mandeep has always strived to create new opportunities for underserved communities and help others in need.

As an undergraduate student, Mandeep was able to restart the student club Engineers Without Borders, a local chapter of the national organization that has a mission to meet the basic needs of some of the world's most vulnerable communities through engineering projects.

Now, as a graduate student nearing graduation, Mandeep hopes to inspire other students to get involved and execute projects throughout their local communities.

"We don't necessarily have to go to a different continent to help someone," Mandeep says. "We can start with a project in the United States, or even in California, just to start somewhere. "

> Whether it's through a club or his role in 3D printing, Mandeep says he strives to live by the same quote every day: "A day spent without helping someone is an opportunity wasted."

Through this quote, he realizes every day is a new opportunity to think and act beyond himself, "even in the smallest of ways."

"We just have to take that small leap of faith — and step — just to help someone," Mandeep says.

WHERE BOLD BEGINS

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Footnote: *Photos by Cary Edmondson, Story by Victoria Cisneros, Video by Domenick Satterberg — University Brand Strategy and Marketing*

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