UTSA software helps patients receive faster post-pandemic care

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Many patients had to wait for lifesaving surgeries, such organ transplants, due to the heavy burden COVID-19 caused for hospitals. Now, UTSA computer science seniors have built a software program

that assists doctors in prioritizing medical procedures and treat people more efficiently.

The program, called ESCal, can organize almost three months of surgeries in a few minutes by simply working within a hospital's existing system.

"For the past nine months we were working on another project for Amita Shah at UT Health San Antonio, but once the outbreak struck, we had to pivot," said Mark Robinson, an assistant professor in practice in UTSA's Department of Computer Science.

The team delivered a computer program that permits a physician to retrieve a list of surgeries scheduled for the next two months in less than five minutes. This is a huge time-saving measure. As businesses ease restrictions, many patients are eager to reschedule elective operations that were postponed.

"The challenge we had was to build a surgery-scheduling application where Dr. Shah and her team could store information about postponed elective surgeries," Robinson said. "The hospital's existing software created lots of problems during the pandemic."

As of May 1, approximately 20 states across the country had resumed some elective surgeries, with only a few more planning to do so later in the month. It's expected that hospitals will face looming bottlenecks and patients who need procedures such as tumor removals will experience long waits.

"We had months [of appointments] already scheduled. As all this was happening we realized that, when this is over, we would have to reschedule everybody," said Shah. "But not everybody's condition is of the same acuity, and with hundreds of surgeries being canceled and

needing to be rescheduled, we needed a way to triage things when we start operating again."

In less than six weeks the UTSA students were able build the software program, which allows Shah to fetch a list of cases. The program relies on surgery information, such as date of surgery, urgency, authorization to perform surgery, patient readiness, cancelations or other criteria. The retrieved data is then reported on a spreadsheet prioritizing current or upcoming procedures for the week.

The system also complies with the hospital's strict security standards and integrates seamlessly with its security infrastructure. This allows patients to obtain speedier care as physicians spend more face-to-face time with patients—and less time struggling with their software.

Since May 4 the new software has already been deployed and rescheduled 50 surgeries. There are plans to make use of this program for the entire surgery department, which typically has 250 to 300 surgeries scheduled per day.

"Students don't always have these real-life and critical problems to solve," Shah said. "But what they are doing really matters, and they are doing it very fast. I'm impressed with how they've come together to help us out. This is very, very valuable and a huge help for our practice."

Besides the transfer of academic knowledge to solve grand challenges, projects such as these provide tremendous real-world experience for students as well as considerable value to their résumés.

In the meantime, Shah is onboarding other surgery departments within UT Health to adopt the software.

The UTSA students who collaborated on this software program are

Jaime Messinger, Andrew Noe, Sam Carey and Tyler Mitchell.

"Now we can say that we contributed to the COVID recovery effort," said Robinson. "We are also ready, should a second COVID wave occur."

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