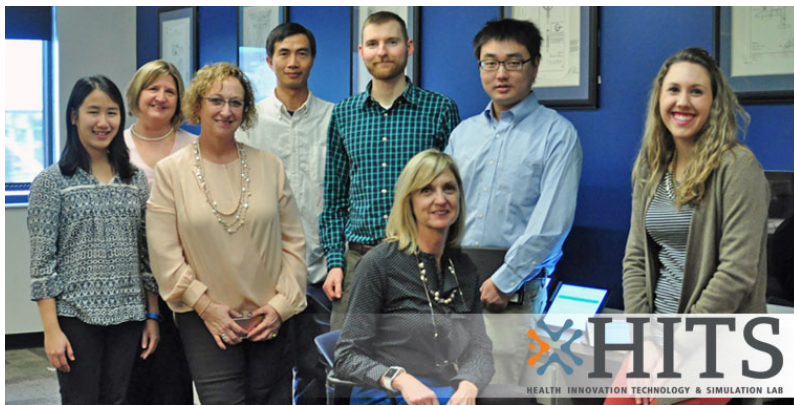




HITS Lab: Reshaping the Future of Health Care



An interdisciplinary lab at the University of Tennessee, Knoxville, is reshaping the future of health care by

developing new technologies to improve patient outcomes and engage health care professionals and students in active learning.

The Health Innovation Technology and Simulation ([HITS](#)) Laboratory is built on a collaborative research partnership between the Tickle College of Engineering and the College of Nursing. Its cofounders and codirectors Xueping Li, associate professor of industrial and systems engineering in the College of Engineering, and Tami Wyatt, the Torchbearer Professor and Associate Dean of Research in the College of Nursing, began working together in 2006 and established the HITS Lab in 2011. Li and Wyatt were interested in the intersection of technology and health care, and how technology can be applied to



social workers.

The interprofessional nature of the HITS team is just one aspect of what makes this lab so unique. Another is its approach to solving health care problems. Every project involves a diverse team of collaborators who use a design thinking approach to tackle a problem from multiple angles and perspectives, establishing a better understanding of an existing problem to create solutions that meet a real need. Wyatt views this as one of the strengths of the HITS Lab.





“When we first started HITS, we utilized technology for the benefit of health care. As HITS became more interprofessional in nature, we became more of an innovation shop,” says Wyatt. “This evolution enriched the way we see things and the way we tackle problems and solve them.”



assistants and, with UTRF's assistance, was sold to Wolters Kluwer Health. It now counts over 40,000 users and is used throughout the United States, New Zealand, Australia, Canada, and a few countries in Europe.

Technologies developed in the HITS Lab typically serve one of two purposes: to promote learning among health care professionals or to promote patient well-being. Two notable HITS Lab technologies focused on active learning are the Simulated Electronic Fetal Monitoring (SEFM) app and the Interactive Debriefing Application (IDA). The SEFM app teaches students how to recognize different fetal heartbeat patterns and monitor a fetus' well-being during labor. The IDA enables passive student observers to participate in simulations by annotating live feed video, which instructors can aggregate to inform face-to-face debriefings. UTRF and the HITS team are currently speaking with a publishing company interested in licensing the rights to it.

HITS Lab apps that promote patient well-being include JASMIN (Just-in-Time Asthma Self-Management Intervention) and the Burn App. JASMIN is a mobile app that allows children with asthma to communicate with family members, health care providers, and school personnel regarding their asthma care and control needs. The app's



The HITS Lab’s research and development efforts go beyond designing and testing mobile health applications. Researchers are also designing big data driven predictive models that can be used in a health care context, and other focus areas include developing inexpensive sensor technology and using virtual reality and augmented reality in a health care setting.

In January 2018, the HITS Lab began working with the East Tennessee Children’s Hospital to identify “Innovation Champions.” This past July, HITS collaborators gathered ideas from hospital staff regarding internal hospital problems that appear across multiple units or services. From these ideas, the lab will identify two significant problems, including at least one that requires designing a product, and will devise pathways to solve them.

“The HITS Lab is truly an interdisciplinary effort, with researchers and students from across UT coming together to tackle the health care issues of today,” says UTRF Licensing Associate Andreana Leskovjan. “UTRF is extremely proud to support their work in any way we can so that their innovations improve the health care landscape for patients and practitioners alike.”

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outside entities and industry. For example, UTRF walked Wyatt and Li through each step in the licensing process for DocuCare, from how to disclose their technology to how to protect their intellectual property, and facilitated the HITS Lab's current collaboration with East Tennessee Children's Hospital.

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