The mission of the Center for Human Applied Reasoning and the Internet of Things (CHARIOT) is to revolutionize personalized education by gathering, processing and helping teachers utilize real-time data about how students are learning. CHARIOT is a collaboration between USC’s Rossier School of Education and Viterbi School of Engineering and combines cutting-edge cognitive science and education research with emerging Internet of Things (IoT) technologies.

OUR MISSION

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OUR WORK

» REDEFINING PERSONALIZED LEARNING
CHARIOT brings together the most innovative thinkers from across USC to develop scalable technologies that will transform personalized learning and shape the future of education. To facilitate truly personalized education, teachers need intuitive and easy-to-understand tools that provide detailed insights not only about each student’s performance, but also about the cognitive and affective factors inside and outside the classroom that impact their level of engagement.

» CAPTURING UNOBSERVABLE COGNITIVE AND EMOTIONAL PROCESSES DURING LEARNING
CHARIOT is using IoT technologies to invent the tools for collecting data about the level of a student’s cognitive engagement and emotions, and processes those data as actionable information enabling teachers to optimize each student’s learning path. As envisioned, these data could provide teachers with insights on which students need assistance, when they need assistance and what kind of assistance they need. The system embeds a feedback loop to scaffold students on content and self-regulation strategies to support their learning experience.

» SCALING IoT SENSORS TO ENHANCE LEARNING
CHARIOT is piloting this vision using state-of-the-art wearable devices — from wristbands and earpieces, to glasses and vests — as well as wired and wireless sensors deployed in a first-of-its-kind smart classroom. Moreover, breakthroughs in mobile technologies will ensure that students, teachers and parents will benefit from richer and more impactful interactions.

Visit chariot.usc.edu for more information.
WHY OUR WORK MATTERS

Education is one of the few remaining sectors that has not been positively disrupted by technology. Integrating the IoT in classrooms and learning has the potential to massively shift our understanding of how students learn in the 21st century and how teachers maximize their learning potential. The technologies that CHARIOT is employing will be used to revolutionize the 21st-century classroom to optimize the learning environments for all students. And beyond the K-12 classroom, CHARIOT’s work will dramatically improve learning and instruction in contexts as divergent as colleges and universities, business and industry, and medicine.

OUR FACULTY AND DIRECTORS

Bhaskar Krishnamachari: Professor and Ming Hsieh Faculty Fellow in Electrical Engineering at USC Viterbi, Krishnamachari brings expertise in the design of algorithms, protocols and applications for next-generation wireless networks and the Internet of Things.

Rao Machiraju: Executive in Residence at USC Rossier, Machiraju has decades of experience in academia and in the tech sector, where he led research and development efforts and invented patented information retrieval and organizational memory systems at Apple.

Ken Yates: Professor of Clinical Education at USC Rossier, Yates is an expert in using cognitive task analysis to capture how experts solve complex problems, and in using information communication technologies to deliver evidence-based instruction to wide audiences.

“Incorporating wearable devices and artificial intelligence into the daily curriculum and teaching methodologies could help teachers to effectively map students’ learning curves and administer tailored interventions at the right time.”
— Ken Yates, Professor of Clinical Education

LEARN MORE
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