Eugene Vasserman, Kansas State University assistant professor of computing and information sciences, has received a National Science Foundation CAREER award for his work with real-time safe and secure coordination of next-generation medical systems.

The award will go toward securing next-generation medical systems—building theoretical foundations and software prototypes to enable safe and secure real-time medical coordination in the presence of not only random faults, but actively malicious actors. Interoperable, reconfigurable systems of medical devices are poised to improve patient care by catching common mistakes, reducing clinician cognitive workload, suppressing false alarms, and streamlining and simplifying continued care, especially when patients move between different medical facilities. As these “smart” networked medical technologies take shape, Vasserman’s research will focus on interconnecting different medical devices from different manufacturers, while preventing misbehavior or unexpected failures from negatively affecting patient outcomes.

Since technology cannot be counted on to function flawlessly, Vasserman has been developing requirements and best practices for “optimistic real-time” safety-critical systems, with built-in fallback to safe states, and integrating these capabilities into existing systems. Software and communication protocols developed as part of this work will allow for global-scale real-time medical care, independent of the location of the clinician or the patient, minimizing the chance of malfunction as a result of natural faults or tampering.

Vasserman received his Ph.D. and M.S., both in computer science in 2010 and 2008, respectively, from the University of Minnesota. He holds a B.S. in biochemistry and neuroscience with a computer science minor, 2003, also from the University of Minnesota.