Cybersecurity Research at the Institute for Simulation and Training
University of Central Florida

Nationally renowned faculty, pioneering research and a student-centered approach to learning have cemented University of Central Florida (UCF) as a center for academic excellence, attracting students from all 50 states and 138 foreign countries. UCF ranks among the most innovative universities in the U.S., according to U.S. News & World Report’s Best Colleges 2016 guide. UCF’s Institute for Simulation and Training (IST) is one of the nation’s leading research centers for simulation, training, modeling, virtual, augmented and mixed reality research for both defense and commercial applications. Cybersecurity and intelligence informatics is a focused research area that IST has developed strong capabilities, some of which are described below.

**Modeling the Human in Cybersecurity**

Human behavior and emotion play an important role in the cyber domain and in shaping policy decisions. Textual content and user linkages fostered by online content and social media networks can be used to examine emotion types, intensity, and contagion. This stream of research seeks to develop new techniques for analyzing emotion and understanding human behavior in the cyber domain. The results have implications for policy making, cyber intelligence analysis, and decision support.

**Social-Media-based Cybersecurity**

Social media analytics and network science are increasingly applied to cybersecurity and intelligence analysis. We are developing a new class of social media analytics techniques and systems that incorporate advanced analytics and models to extract and analyze user opinion from voluminous social media data. Ongoing works include analyzing social media discussions on border security and immigration issues, and helping organizations to identify opinion leaders and activists in social media discussion network. Novel applications of social media include enhancing critical infrastructure resilience and supporting health informatics.
**Big Data Approaches for Intelligence Informatics**

The volume, velocity, and variety of data useful in the cyber domain are growing rapidly. New techniques and systems are needed to assist in intelligent analysis, modeling, and simulation of cyber phenomena. This stream of research develops new theories, approaches, and technologies for analyzing and visualizing big data in the cyber domain.

**Vulnerability Assessment and Threat Mitigation of Cyber-Physical Systems**

Cyber-physical systems (CPS) are increasingly used in the military and civilian domains. Their security is also of increasing concern. This stream of research is developing new techniques, metrics, and systems to automatically assess and to mitigate vulnerabilities of CPS. Ongoing works include developing relevant framework and tools in the context of mission-critical CPS.

**About IST**

Founded in 1982, IST is one of the nation's leading research centers in modeling and simulation, and is a research arm of the UCF. IST employs more than 260 full-time researchers, support personnel and student interns. IST’s laboratories, workspace and administrative offices occupy more than 80,000 sq. ft. at its three Central Florida Research Park locations, the Partnership II and III buildings and the Simulation Training Technology Center. Large portions of the institute’s facilities are configured as laboratories and research workspace. IST and UCF research faculty, students, and program managers share this significant laboratory space with the Army and conduct joint research projects. Current laboratories support research in computer generated forces, embedded training, virtual, mixed and augmented reality, computer graphics, high performance parallel processing, interactive entertainment, public safety, advanced distributed learning, computer-controlled robotics, human factors and behavioral science. 25,000 sq. ft. in the Simulation Training Technology Center is principally dedicated to Army simulation training initiatives and the Army Research Institute. Additional laboratories are available in the Partnership II and III buildings.

**Opportunities to Work at IST**

Many opportunities for Ph.D. students, post-doctoral researchers, and graduate and undergraduate students to work on projects at IST. If you are interested, please email your contact information and resume to:

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