



NEXT-GEN CYBER TITANS

CYBERFELLOWS.UTULSA.EDU

A scholarship initiative brought to you by



TODAY'S CYBERSECURITY CHALLENGES REQUIRE BIG IDEAS AND BOLD SOLUTIONS.

Join us in exploring the opportunities that exist at the intersections of science and entrepreneurship.

The University of Tulsa (TU) seeks talented students interested in pursuing world-class PhD research in cyber research while supported by a full-tuition scholarship and competitive living stipend. TU is a private university located in Tulsa, Oklahoma, a beautiful, bustling metro of 1 million nicknamed "Green Country" for its rolling hills and treed landscapes. TU has been a leader in cyber security research and education for over two decades, as reflected by its recent ranking in the **top 25 nationally among cybersecurity programs** by U.S. News & World Report.

TU's College of Engineering & Natural Sciences houses a unique initiative - the **TU-Team8 Cyber Fellows** - that enables PhD students to pursue research with high commercialization potential involving cyber security, data analytics, artificial intelligence, machine learning, and human/social behavior, all of which can be part of multiple engineering and science disciplines. Sponsored by the Tulsa Innovation Labs, the Cyber Fellows work with their faculty research advisors in partnership with Team8, a company-building venture group. While Cyber Fellows currently are pursuing PhDs in computer science, computer engineering, and mechanical engineering, a new PhD in Cyber Studies expands research pursuits to interdisciplinary studies, such as finance, law, and economics.

Graduate Research Assistantships are awarded to Cyber Fellows. These assistantships provide an **annual stipend of \$30K** with full tuition remission, health insurance, and opportunities for summer internships. If awarded as a TU-Team8 Cyber Fellow, the assistantships are renewable each year given progress toward the degree. A wide range of research projects is available. Faculty participating in the Cyber Fellow initiative have received substantial funding for their research from the National Science Foundation, Department of Defense, Department of Energy, and Department of Homeland Security.

Please visit our website [CYBERFELLOWS.UTULSA.EDU](https://cyberfellows.utulsa.edu) and consider joining one of our information sessions to learn more about who we are, what we do, and how you can fit in! Application review begins on **February 1, 2022** and continues until all positions are filled. Don't miss your chance to join our team! If you check the box that you are interested in the TU-Team8 Cyber Fellows within the graduate school application at <https://graduate.utulsa.edu/admission/applying/> and complete your application for review, **we will pay your application fee.**



SCAN TO VISIT THE
CYBER FELLOWS
WEBSITE

FOR MORE INFO CONTACT

Randy Roberts, Cyber Innovation Strategy Manager
randy-roberts@utulsa.edu | 918-631-6523 | University of Tulsa

CYBER FELLOWS SELECT PROJECTS

See website for a full list of projects

Money Laundering in the Sharing Economy : The fundamental goal of money laundering is to make criminal income appear as if it has been derived from a legitimate source. Cybercriminals use the sharing economy platforms, including ridesharing, short-term rentals, the gig economy, on-demand delivery, peer-to-peer lending, crowdfunding, reselling and trading, and even entertainment and video games, to launder their ill-gotten gains. The AML research group draws on previous work conducted in criminology and is working toward novel ways to detect criminal activity.

Mentors: **Stephen Flowerday**, Ph.D. - stephen-flowerday@utulsa.edu **Weiping Pei**, Ph.D. weiping-pei@utulsa.edu

The Impact of Security Alert Overload : To explore the challenges organizations face when running their own SOC or using a virtual SOC provided by a managed security service provider. What makes this research different is the focus on the interplay between organizational, human, and technical challenges present in operating a successful SOC.

Mentors: **Sal Aurigemma**, Ph.D. - sal-aurigemma@utulsa.edu, **Bradley Brummel**, Ph.D. - bradley-brummel@utulsa.edu, **Tyler Moore**, Ph.D. - tyler-moore@utulsa.edu, **Stephen Flowerday**, Ph.D. stephen-flowerday@utulsa.edu

Machine Learning Prediction of Transactions, Properties and Anomalies on Cryptocurrency Networks: Predicting anomalies in transaction and other networks will require network theoretic and machine learning approaches that are able to detect interactions and complex relationships between variables in high dimensional data. Our goals are to characterize topological properties of transaction networks, predict future transactions, and identify anomalous behavior. We will develop new network and machine learning approaches to address security and robustness questions for cryptocurrency networks and other time varying networks that may experience unexpected changes. We will combine machine learning and graph neural networks with Kalman filters to predict future transactions and anomalies.

Mentors: **Sal Aurigemma**, Ph.D. - sal-aurigemma@utulsa.edu, **Tyler Moore**, Ph.D. - tyler-moore@utulsa.edu, **Bradley Brummel**, Ph.D. - bradley-brummel@utulsa.edu

VR Training Simulation Framework: This project aims to create a viable framework for delivering different types of VR training simulations to educators to develop simulations that have multiple correct answers, ordered and unordered series of steps, and valued accuracy of each procedure.

Mentors: Ms. **Akram Taghavi-Burris** - akram-burris@utulsa.edu, and **John Hale**, Ph.D. - john-hale@utulsa.edu

Leveraging Attack Graph State Estimation for Cyber Defense: This project will focus on developing attack graphs showing how a system can be compromised to build and deploy cyber defense tools that continuously monitor the system and adapt to changing conditions.

Mentor: **Peter Hawrylak**, Ph.D. - peter-hawrylak@utulsa.edu

Trusted AI Through Personalized Explanations - PERX & EXPLORE: Building on prior research on trusted human-AI collaboration and transparent decision-making, this project develops two complementary frameworks in the increasingly critical area of Explainable Artificial Intelligence (XAI): Personalized Explanation Systems (Perx) and Explaining Options & Recommendations (EXPLORE). Medical device application provides the data source needed to prototype the framework.

Mentors: **Sandip Sen**, Ph.D. - sandip@utulsa.edu and Will LePage, Ph.D. - will-lepage@utulsa.edu

An Interpretable and Trustworthy AI Framework for Smart Grid Cyberattack Detection and Recovery: This project proposes a novel, interpretable, and trustworthy machine learning framework that detects fault and cyber attack incidents associated with the electric power grid and its recovery from critical system incidents in real-time.

Mentor: **Mahdi Khodiyar**, Ph.D.- mahdi-khodiyar@utulsa.edu

BECOME A NEXT-GEN CYBER TITAN

Be a TU-Team8 Cyber Fellow

Begin the application process today to join a cohort of passionate and purpose-driven individuals who will shape the future of these emerging fields.

The University of Tulsa seeks to recruit and retain talented students, faculty and staff from diverse backgrounds. The University of Tulsa is an affirmative action/equal opportunity employer and encourages qualified candidates across all group demographics to apply. The University does not discriminate on the basis of personal status or group characteristic including, but not limited to race, color, religion, national or ethnic origin, age, sex, disability, veteran status, sexual orientation, gender identity or expression, genetic information, ancestry, or marital status. The University of Tulsa is an Equal Opportunity Employer including Disability/ Veteran.