

ATTENTION STUDENTS

OPPORTUNITY TO PRESENT AT THE 2019 SPIE CONFERENCE ON DISRUPTIVE TECHNOLOGIES FOR INFORMATION SCIENCES!

WIN STUDENT COMPETITION AND YOU WILL BECOME PART OF AN **EXPERT STUDENT PANEL** DISCUSSING THE NEXT GENERATION OF DISRUPTIVE TECHNOLOGIES WITH SOME OF THE MOST PROMINENT MEMBERS OF THE GLOBAL SCIENTIFIC COMMUNITY

CHANCE TO NETWORK, DISCUSS YOUR IDEAS WITH INDUSTRY LEADERS, AND POSSIBLY SECURE A **SUMMER INTERNSHIP OR JOB OPPORTUNITY!**

The 2019 SPIE Conference on Disruptive Technologies for Sensors and Sensing Systems will be held at the Baltimore Convention Center, Baltimore, Maryland, United States 14 - 18 April 2019. The conference will feature an expert student panel and student posters.

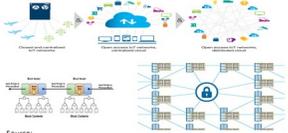
The students will be selected from a competitive selection process in which students from multiple universities will submit a topic they believe represents the most disruptive technology of the future. The winning students will serve as expert panel members fielding questions on their respective topics from the research community. They also will present posters on their topics during the SPIE Defense and Commercial Session poster session over two nights. This will be a fantastic opportunity for students to gain valuable real-world research experience to enhance their resumes and to attend a globally recognized conference providing both networking and career opportunities.**

TO APPLY

Students should submit a 500 word or less abstract about a topic they feel represents the most disruptive technologies of the future. Students are also asked to submit a poster (formatted as shown below), and their current resume.

SUBMIT THE FOLLOWING BY 15 FEBRUARY 2019 to TECHNOLOGYDISRUPT2019@GMAIL.COM

- 1) ABSTRACT 500 WORDS OR LESS (PDF FORMAT)
- 2) SINGLE SLIDE POWERPOINT PRESENTATION (QUAD CHART FORMAT SHOWN BELOW)
- 3) CURRENT RESUME

Blockchain technology	
 <i>Student Sponsored</i>	
<p>Description</p> <ul style="list-style-type: none"> • Blockchain technology is the backbone of bitcoin but has many other uses • Extremely secure system for transferring ledgers through a distributed network • Modification is the keyless signature infrastructure used in Electronic-Estonia (E-Estonia) • Infrastructures secured by blockchain technologies will provide the needed transaction transparency to ensure tamper when transferring important information 	<p>Blockchain Operational Concept</p>  <p>Source: https://www.theregister.co.uk/2016/02/28/bn_open_source_blockchain_code/ https://www.linkedin.com/pulse/blockchain-dec-in-democracy-mirana-guila</p>
<p>Advantage Over Current State</p> <ul style="list-style-type: none"> • For future operational environments to be scalable they need to break away from their dependence on a centralized cloud/management platforms • Decentralization of trust can occur in architectures equipped with basic cryptographic tools and security functions like those found in the blockchain architecture 	<p>Student Name and Affiliation</p>  Student Name Student University student linkedin address

**Limited travel subsidies will be made available for students unable to secure funding from their college or University. Sponsorship for this event is provided by the US Army Research Laboratory, US Air Force Research Laboratory, the Griffiss Institute, and private industry.

Examples of prior winning submissions

Title: Bitcoin and Blockchain Technology

There's a lot of hype in technical journals about blockchain technology. A recent World Economic Forum report predicts that by 2025 10% of GDP will be stored on block chains or a type of distributed ledger system which is the underlying architecture for blockchain related technology. Blockchain technology is gaining momentum in both government and the private sector. In the past few years, variations of block chain type secure information transfer systems have been implemented in countries around the world as a means to secure information transfer and enabled digital societies. Estonia is an example of a country that has taken a step towards a more secure digital system with transaction transparency. The Estonia's digitized societal infrastructure has demonstrated a transformation of the systems people rely on today. It shows how we can evolve into a radical new world of revolutionized banking infrastructures and information transfer that is reliable and sustainable. The Estonia government has demonstrated how information can be managed and transferred with blockchain technology to preserve security and reliability.

Blockchain technology can provide both government and private agencies a secure network to share data and securely complete transactions without fear of security compromises due to the transparency of transaction history. It could lead to new network and software architectures for online banking ensuring that our economy will be less vulnerable to hacking threats. In time, more people around the world will realize the potential of blockchain technology to secure their sensitive data and improve our security with so many networked devices. This will lead to more countries of the world to adopt a digital infrastructure like Estonia. When the world embraces blockchain technology, there will be hope for greater government efficiency and transparency. Imagine an election system where there is no threat of voter fraud or election tampering. If blockchain is implemented into the global economy the world will become a much more secure and reliable place for ensured flow and trust of data that is transmitted across a chaotic and often unreliable network of computer systems and connected devices.

Title: In-Vivo Wireless Nanosensor Networks

With the recent progress in nano-bioscience, it is not beyond imagination that within a few years we will see the emerging nano-bio devices in our daily life with remarkable applications ranging from healthcare monitoring wearables and intra-body microfluidic nano-sensors to brain-machine interface (BMI) implants. Independently of the specific application, one of the most important challenges in this area is the communication between these devices, which is the interest of a part of our research group. More specifically, we are working on different aspects and layers of communication networks, namely: the development of novel optical plasmonic nano-antennas; the characterization of the channel for both nanoscale intra-body and wireless on-chip communications; the development of new modulation schemes and protocols tailored to these networking paradigms; and system-level design for this new technology. The objective of our research is to pave the way for development of unprecedented applications among which the following can be mentioned as our current focus:

- Optical plasmonic communication among autonomous in-vivo nano-bio-sensors, which can operate inside the human body in real time, and have been recently proposed as a way to provide faster, low-cost, and more accurate disease diagnosis and treatment than traditional technologies.
- Establishing the foundations of distributed neuronal activity monitoring with cooperative nano-devices for next-generation nanophotonic brain-machine interfaces.
- Create an ecosystem (hardware + software) able to provide wireless connectivity to on-body wearable medical devices which act as an interface between intra-body information sources (e.g., nano-sensors, biological processes) and a user's personal device (e.g., cellphone, tablet).