INFORMATION SYSTEMS TECHNOLOGY AND DESIGN

Discovery

We SHARE to inspire and ignite ideas for
Information Systems Technology & Design (ISTD) Pillar!

The titles featured here are to give you a peek into the wealth of resources we have. We hope, through this will encourage you to explore and read further. Share with us topics of importance to ISTD and we can introduce relevant titles from some 400,000 eBooks we carry.

January 2016

PUBLICATIONS BY ISTD

Attacking Fieldbus Communications in ICS: Applications to the SWaT Testbed
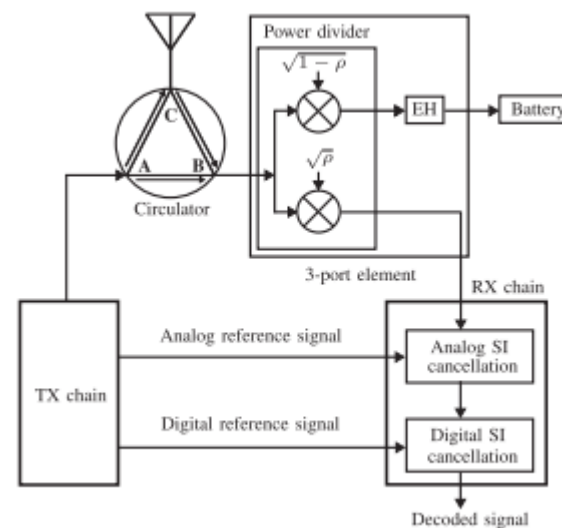
Co-authored by ISTD Assistant Professor, Nils Ole Tippenhauer

Using the Secure Water Treatment (SWaT) as a testbed, the researchers have used a prototype Man-in-the-Middle (MitM) attack to show the challenges faced by the attacker and how they overcome these challenges to add themselves in the ring topology. The practical attacks are carried out on SWaT to demonstrate their impact on the physical process.

Source: Proceedings of the Singapore Cyber-Security Conference (SG-CRC) 2016 (January 2016)

Energy-Recycling Full-Duplex Radios for Next-Generation Networks

Co-authored by ISTD Assistant Professor, Tony Q.S. Quek

Full-duplex (FD) devices which can concurrently transmit and receive signals in the same frequency band, aids in enhancing the performance of current networks. To prevent the FD radio throughput from degrading, a novel energy-recycling single-antenna FD radio was designed which brought upon advantages over the state of the art in spectral efficiency and energy consumption.

Source: IEEE Journal On Selected Areas In Communications (December 2015)

INTERNET OF THINGS (IOT)

How The Internet Of Things Is Changing Work

Technologists predict how IoT will change our workplace paving way to new jobs and skills which will be required to attain new levels of economic activity in an IoT world. This includes tracking movement, changes to industrial jobs and collaborative tools.

Source: Fast Company (January 2016)

A Security Gateway Application For End-To-End M2m Communications
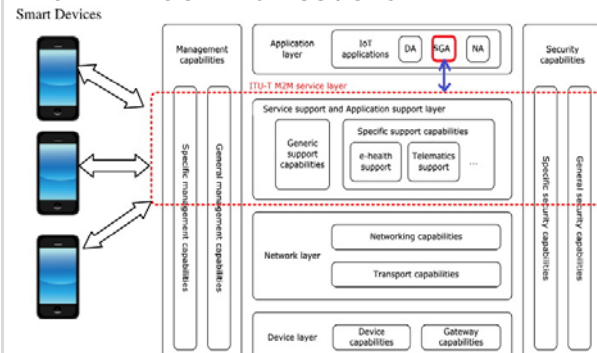
M2M (Machine-to-Machine) communication is vital for IoT systems, however when traditional security solutions are applied to E2E (End-to-End) M2M network, it becomes vulnerable to various attacks. The security aspects for such communications are explored here, proposing a security gateway application (SGA) meeting the basic security requirements.

Source: Computer Standards & Interfaces (February 2016)

BIOINFORMATICS

PhenoBlocks: Phenotype Comparison Visualizations

Diagnosis of hereditary disorders has been a challenge for medical practitioners as it is text-based and involves data gathering, review medical histories, physical & psychological examinations and so on. By applying visualization in bioinformatics, researchers have developed a visual analytics tool to compare phenotypes between patients and the distinct feature of a disorder or between patients, aiding in differential diagnosis.

Source: IEEE Transactions on Visualization and Computer Graphics (January 2016)

Integrating 400 million variants from 80,000 human samples with extensive annotations: towards a knowledge base to analyze disease cohorts

High-throughput sequencing technologies are being used to detect variants in large resequencing studies. However, annotations need to be done from scratch for new variants where computation of functional predictions and population frequencies are costly. The researchers have built a repository to decrease the operations needed as well as assembling variants and their frequency distributions in various populations.

Source: BMC Bioinformatics (January 2016)

ARTIFICIAL INTELLIGENCE

Yahoo Releases Largest-Ever Cache of Internet Behaviour Data

Internet giant Yahoo Inc. will be releasing 13.5 terabytes of its users' internet behaviour data b to university researchers, to further their research in artificial intelligence and machine learning. Though this is a huge boon for researchers, the release of the anonymized data has caused alarm among its users as it provides interaction data and demographic information.

Source: Digital Trends (January 2016) & The Chronicle of Higher Education (January 2016)

Technology: Inventive Artificial Intelligence Will Make All of Us Better

Artificial intelligence has been transforming our lives. The next step will be Inventive AI – training machines to tackle a wider range of issues based on specific collections of relevant data. But could these replace human decision-making? This article provides an insight on this and principles that makers of (AI) should adhere to, including aiming for the common good, rather than a few.

Source: TIME (January 2016)