

Discovery

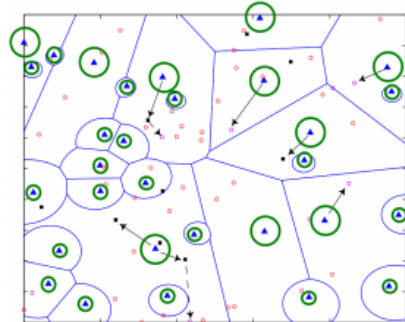
We SHARE to inspire and ignite ideas for
Information Systems Technology & Design (ISTD) Pillar!

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.

March 2016

PUBLICATIONS BY ISTD

Heterogeneous Cellular Network With Energy Harvesting-Based D2D Communication

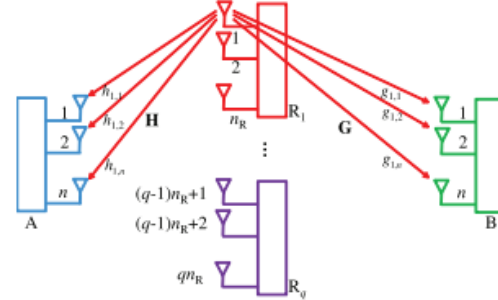


By ISTD PhD Student Howard H. Yang, SUTD iTrust Research Fellow Jemin Lee & ISTD Assistant Professor, Tony Q.S. Quek

In device-to-device (D2D) communication, privacy & power consumption pose problems as User Equipment Relay (UER) needs to use its own power to forward the information of other UEs (User Equipment). In this research article, authors from SUTD have proposed a "D2D communication provided energy harvesting heterogeneous cellular network (D2D-EHFN), where UERs harvest energy from an access point (AP) and use the harvested energy for D2D communication."

Source: [IEEE Transactions On Wireless Communications](#) (February 2016)

Physical-Layer Secret Key Generation With Colluding Untrusted Relays



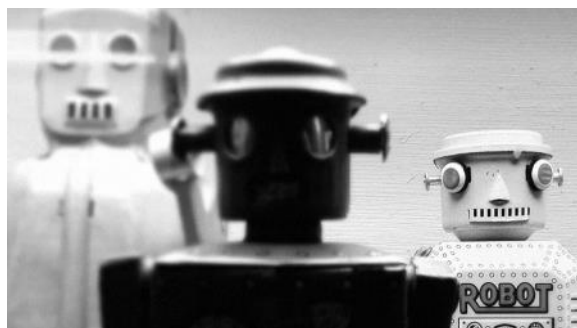
iTrust Postdoctoral Research Fellows, Chan Dai Truyen Thai & Jemin Lee, & ISTD Assistant Professor, Tony Q.S. Quek

The topic on security for wireless communications at physical layer has been trending lately, particularly on establishing confidential communication links without using a secret key. However, such a scheme may not always be feasible. The authors of this paper have proposed a physical-layer secret key generation mainly for a direct communication link between legitimate transmitter and receiver where it has designed with "zero forcing (ZF) and minimum mean square error (MMSE) channel estimators for non-, partially, and fully colluding modes of untrusted relays."

Source: [IEEE Transactions On Wireless Communications](#) (February 2016)

INTERNET OF THINGS (IOT)

Why The Internet Of Things Might Never Speak A Common Language



If you happened to have different devices tapping on Internet of Things, there might be some communication breakdown between them. Why? Simply due to the fact there is no standardization of communication for such devices. Produced by different companies, they show little interest in standardizing the communication between these devices. Is it too early or too late to do so? Find out more in this article.

Source: [Fast Company](#) (March 2016)

Learn to Stop Worrying and Love the Cloud



A lack of trust in the technology has led to rise of resistance to using cloud services. By citing an example of how computer-aided design (CAD) companies are promoting cloud CAD where users are able to share design files, this article discusses the increasing use of cloud computing due to IoT and how to "embrace" the cloud.

Source: [Machine Design](#) (February 2016)

MACHINE LEARNING

Evaluating machine learning classification for financial trading: an empirical approach



Machine learning could be applied in many industries including financial trading. This paper looks at how simple machine learning models assist to achieve profitable trading with a series of trading simulations in the FOREX market. Also, it highlights how machine learning-based predictors such as price related features, seasonality features and lagged values helps to enhance classification capabilities which could lead to profitability.

Source: [Expert Systems with Applications](#) (July 2016)

Combination forecasts of tourism demand with machine learning models

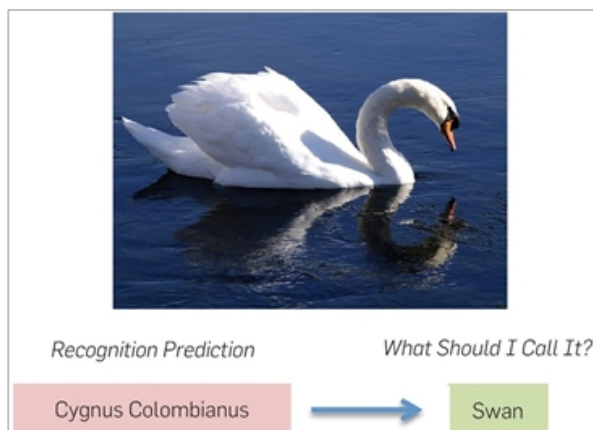


Another industry where machine learning comes in handy: tourism. By applying three machine learning techniques, namely support vector regression, Gaussian process regression and neural network models, they attempt to predict regional tourism demands and compare its accuracy with estimated models on the aggregates series. Eventually, the predictions generated using the machine learning techniques outperformed those generated with aggregated series.

Source: [Applied Economics Letters](#) (April 2016)

NATURAL LANGUAGE PROCESSING

Learning to Name Objects



Computational visual recognition has made remarkable progress where it could accurately classify objects into thousands of different categories. But are they able to produce category labels just like how most humans would label (like the swan example above)? This research looks into this problem by studying human naming on a bigger scale, providing suggestions on "improving human-focused computer vision applications such as automatically generating a natural language description for an image or text-based image search."

Source: [Communications of the ACM](#) (March 2016)

Sentiment Analysis And The Complex Natural Language



Opinion mining is done on text, to extract sentiments and learn about public perception on various issues through natural language processing (NLP). However, documents with higher recurrence of matching words may not necessarily contain the same sentiment polarity. This article discusses sentiment analysis techniques including highlighting the need to address NLP's challenges in sentiment analysis.

Source: [Communications of the ACM](#) (March 2016)