



IEEE-GLOBECOM 2018 – Report

On 9-13 December 2018, IEEE Global Communications Conference (GLOBECOM), which is sponsored by IEEE (Institute of Electrical and Electronics Engineers, Inc.) and IEEE ComSoc (IEEE Communications Society), held in Abu Dhabi, capital of the United Arab Emirate (UAE). GLOBECOM is one of the IEEE Communications Society's two flagship conferences dedicated to driving innovation in nearly every aspect of communications, including security. Each year, more than 3000 scientific researchers and their management submit proposals for program sessions to be held at the annual conference. This 5-day event includes several keynote speeches by distinguished speakers from industry, academia and government sectors; panels and forums; technical sessions featuring technical papers extensively reviewed by peers; workshops focusing on the latest trends in various technology, including Vehicular Networking and Intelligent Transportation Systems (VENITS) workshop. The workshop featured 10 presentations by researchers from Germany, Finland, Sweden, Canada, Russia, China, Italy, India, Luxemburg, USA, and Belgium. Every presenter spoke on the topic of vehicular networking and the intelligent transportation systems area. The papers included PHY techniques for vehicular communication, connectivity properties of vehicles for development of 3GPP NR system, offloading schemes to minimize latency in vehicular edge computing, MIMO VLC systems for vehicular application, maximum reuse distance scheduling for cellular-V2X sidelink, wireless charging system for autonomous electric vehicles, and malicious node detection in vehicular Ad-Hoc network using machine learning and deep learning. The workshop ended with the presentation "Malicious Node Detection in Vehicular Ad-Hoc Network Using Machine Learning and Deep Learning," given by Prof. Balador. In his presentation, Prof. Balador argued that the dynamic nature of the vehicular network topology has posed many security challenges for effective communication among vehicles. Consequently, different models have been applied in the literature to checkmate the security issues in the vehicular networks. Existing security models lack flexibility and sufficient functionality in capturing the dynamic behaviors of malicious nodes in the highly volatile vehicular communication systems. He presented a new trust model with respect to Machine/Deep Learning (ML/DL) to fill the gap in the area of network security by the existing models. The proposed model provides a data-driven approach in solving the security challenges in dynamic networks. This model goes beyond the existing works conceptually by modeling trust as a classification process and the extraction of relevant features using a hybrid model like Bayesian Neural Network that combines deep learning with probabilistic modeling for intelligent decision and effective generalization in trust computation of honest and dishonest nodes in the network.

Regarding security, a tutorial was presented and focused on blockchain for cyber physical systems, applications, opportunities and challenges by Salil S Kanhere from University of New South Wales, Australia and Raja Jurdak from University of Queensland, Australia. They argued that current CPS ecosystems rely on centralised, brokered communication models, otherwise known as the client-server paradigm. All devices are identified, authenticated and connected through cloud servers and the data collected by the devices is stored in the cloud for further processing, but this will not be able to respond to the growing needs of the large-scale CPS ecosystems of tomorrow with billions of connected devices. Cloud servers will remain a bottleneck and point of failure that can disrupt the entire network. This is especially important as critical services and infrastructure such as healthcare, electric grids, logistics, transportation become dependent on CPS. In this tutorial, the presenters explored how Blockchain (BC) technology has the potential to provide solutions for the aforementioned challenges. The tutorial particularly considered three key aspects of CPS which include: (i) Internet of



Things; (ii) Intelligent Transportation; and (iii) Supply Chain. Also, it included relevant concepts, review the state-of-the-art, present representative solutions that have been proposed and discuss open challenges.

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