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AISA Webinar: Distributed ledger technology for security, trust, transparency, and traceability

Hosted by the AISA Cloud Branch, please join Dr Malka Halgamuge, who is a Researcher in the Department of Electrical and Electronic Engineering at the University of Melbourne, for an online presentation on the why, what, and how blockchain technology could be used for security, trust, transparency, and traceability of data.

Topic: **Distributed ledger technology for security, trust, transparency, and traceability**

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The blockchain is a distributed decentralised database that can be seen as a digital ledger or as a collection of timestamped blocks. This is a scientific breakthrough that obtained unique consideration from academia, industry, and government throughout the world. It has the true

potential to be adopted in current business models. However, consensus algorithms play a significant role in terms of security.

The first part of this presentation is focused on how consensus algorithms could impact the overall probability for a malicious user to attack a system. A sharding mechanism could potentially be the solution to enhance the scalability of blockchain networks and makes the distributed ledger technology more feasible. Despite the scalability improvement, it increases the influence of malicious attacks on blockchain networks.

The second part of this presentation is focused on how the trade-off between scalability and security in sharding-based blockchain networks can be performed and how to develop a trust model by estimating the trust score of nodes to minimise the adversary influences of malicious attacks. The Internet of Things Application (IOTA) Tangle network has replaced the sequential blockchain approach with a Directed Acyclic Graph (DAG) based distributed ledger technology specially designed for the IoT/IoE industry.

The third part of this presentation focuses on the models that we design for traceability: COVID-19 vaccine tracing and agri-food supply chain and we also explore the different methods we used to reduce network latency and malicious attacks.

Speaker: Dr Malka N. Halgamuge

Malka is a Researcher in the Department of Electrical and Electronic Engineering at the University of Melbourne. She obtained her PhD from the same department in 2007. She was awarded the Chinese Academy of Sciences President's International Fellowship (2017), Incoming Leaders Fellowship from Australia India Institute @ Delhi (2016), Next Step Initiative Fellowship (2015), Australia-China Young Scientist Fellowship (2014), Dyason Fellowship at the University of California (UCLA), Los Angeles, USA (2013), Early Career Researcher (ECR) Award from Alexander von Humboldt Foundation (2013) and Solander Fellowships at Lund University, Sweden (2007 and 2008). She is the recipient of the Vice-Chancellor's Engagement Award (2010) and Vice-Chancellor's Knowledge Transfer Award (2008) for her research at the University of Melbourne.

She has published more than 120 peer-reviewed technical articles. In addition to her publications, her research has acquired significant attention, resulting in an invitation to present 50 invited/guest lectures at Universities and Industry, including Oxford University, IBM Research, and the delivery of 9 IEEE talks. She is passionate about research and teaching university students (Emerging Technologies, Blockchain and Smart Contracts for security, trust, transparency and traceability of data, Internet of Things, Business Intelligence in Big Data, Machine Learning Solutions and Bioelectromagnetics).

Participants will have the opportunity to ask questions. This webinar will be recorded and the recording will be made available to registrants.

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https://us02web.zoom.us/webinar/register/WN_tdsObn7vRrCTIoalBh4ymA

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Date: **Wednesday 29 September 2021**

Time Zones:

- **12:30pm - 1:30pm AEST** (Brisbane, Canberra, Melbourne Sydney & Hobart)
- 12:00pm - 1:00pm ACST (Adelaide & Darwin)
- 10:30am - 11:30am AWST (Perth)

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