

# User interaction engineering: measuring cognitive load for safety and efficiency

Joint Electrical Institutions Sydney - Engineers Australia, IEEE, IET



ENGINEERS  
AUSTRALIA

## DATE & TIME

Thursday, June 11, 2015  
5:30 pm for 6:00 pm start

## VENUE

Engineers Australia Harricks  
Auditorium  
Ground Floor, 8 Thomas Street,  
Chatswood NSW 2067

## COST

EA, IET, IEEE Members – Free  
Students – Free  
Non-members - \$30

## CPD

Eligible for 1.5 Continuing  
Professional Development hours.

## RSVP

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The Knowledge Network

## Presentation by Ronnie Taib, Principal Research Engineer NICTA (National ICT Australia)



How we interact with machines and humans alike depends on the amount of working memory available in our brain to process information we receive and produce. In mission critical situations, operators may become mentally overloaded by the complexity of the task at hand coupled to high volumes of information. Alarms and other important cues may simply get overlooked or even aggravate the issue, just because the brain cannot cope.

Over the past ten years, our research team carried out empirical studies aiming to measure cognitive load unobtrusively and in real-time. Capturing behavioural and physiological signals under controlled task conditions, and analysing them with machine learning methods can help determine the tipping point of interaction performance: when is it time for the machine to slow its information flow to ensure the user gets it all?

The results of this research was applied in domains ranging from road and air traffic control, call centre staff retention, to elite athlete training. More recently, we focused on detecting inattention at the wheel, which was identified as the root cause of more than 25% of road crashes and near misses.

This talk will review some of this work and highlight the broader potential of cognitive load management coupled to machine learning and data analytics in order to improve user interaction and efficiency in other engineering disciplines.

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## SPEAKER BIOGRAPHY

### Ronnie Taib

Ronnie Taib is a principal research engineer at NICTA in Sydney. He is part of the Machine Learning research group, with all his projects deliveries into the Infrastructure, Transport and Logistics business unit. In the past 10 years, he has been applying his expertise in computer science, human-computer interaction and cognitive science to the intelligent transportation systems domain, in particular through a long-term partnership with the NSW Transport management centre, and a collaboration with the Fraunhofer Institute in Germany to improve road safety.

**For further information contact– Sherry Moghadassi**

Email: [sherry.moghadassi@gmail.com](mailto:sherry.moghadassi@gmail.com)

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