



HDR Seminar 19
Program
23 June 2022

12:00pm - 12:15pm	Briefing: A/Prof Dongmo Zhang Topic: Policy updates and announcements
12:15pm - 12:45pm	Invited Speech Topic: Using rapid stimulus presentation and multivariate classification to study information processing in the human brain Speaker: Dr. Tijl Grootswagers
12:45pm - 1:00pm	Candidature Research Presentation Topic: A Comparative Study on the Variants of R Metric for Network Robustness Speaker: Balume S. Mburano (PhD candidate 17508360) Supervisory Panel: Dr. Weisheng Si, Prof. Wei Xing Zheng
1:00pm - 1:15pm	Candidature Research Presentation Topic: My Journey from <i>SoCDMS 2021 End of year wrap up session</i> to <i>SoCDMS 2022 HDR Forum</i> Speaker: Prathayne Nanthakumaran (PhD candidate 19625690) Supervisory Panel: Dr. Liwan Liyanage, Dr. Michael O' Connor
1:15pm - 1:30pm	Closing

Venue: Online Zoom

Meeting ID: 859 9166 3307

Password: HDR

Next Event: 28 July 2022

Using rapid stimulus presentation and multivariate classification to study information processing in the human brain

Speaker: Dr Tijl Grootswagers

Biography:

Dr Tijl Grootswagers is a computational cognitive neuroscientist who combines cutting-edge machine learning techniques, neuroimaging, and behavioural data to understand how the brain represents and processes information. More specifically, He investigates how the brain perceives and represents visual objects, and how it uses these representations for decision making. He flexibly uses various neuroimaging techniques, such as functional Magnetic Resonance Imaging (fMRI) to examine representations in different brain areas, or magnetoencephalography (MEG) and electroencephalography (EEG) to study the temporal dynamics of information processing. Tijl uses state-of-the-art multivariate pattern analysis (MVPA) or “brain decoding” methods to analyse neuroimaging data. In addition, he develops novel approaches for relating brain activity patterns to human behaviour and artificial models of human cognition.

A Comparative Study on the Variants of R Metric for Network Robustness

Speaker: Balume S. Mburano (PhD candidate 17508360)

Abstract:

Robust network infrastructures are essential for the delivery of vital services in our daily lives. With the widespread cyber-attacks on them, measuring the robustness of these networks has become an important issue. In recent years, many robustness metrics have been proposed for this purpose. Among them, a metric called ‘R’ has received wide attention, and several variants have been proposed. These variants include a metric called Communication Robustness (CR) and the betweenness and closeness variants to both R and CR. However, no evaluations of the correlations among these variants have been made to shed light on their necessity and effectiveness. Addressing this research gap, this paper makes the following contributions. First, we measure the correlations between R and CR to verify that CR is valid to exist due to its unique perspective although it correlates closely with R. Second, we measure the correlations between R and its betweenness/closeness variants to show that they are quite different, and the same is observed for CR and its betweenness/closeness variants. Finally, we propose a new robustness metric called Simplified Communication Robustness (SCR), which simplifies the calculation of CR while working almost the same as CR.