# BHS Symposium 2026

## Minds in Motion

Program schedule

Learning Studio, Experimental Medicine Building, NTU, Singapore

1-2 July 2026 | Wednesday-Thursday

DAY 1

**Wed, 1 Jul 2026**

## Day 1

Talks · Workshops · Breaks · Visits

### MORNING / PART 1

**0800** — MEAL
**Breakfast & Registration**
Arrive, collect materials, and meet fellow participants.

**0900** — OPENING
Prof Annabel | Nanyang Technological University, Singapore
**Opening Address**
Welcome and symposium kickoff.

**0910** — TALK
Dr Hsu Tzu-Yu | National Central University, Taiwan
**Neural correlates of switching between internally and externally oriented thoughts**
Internal/external cognition, EEG, fMRI, rumination, and attentional switching.

**0955** — TALK
Dr Byung-Dong Oh | Nanyang Technological University, Singapore
**To model human linguistic prediction, make LLMs less superhuman**
Human-like memory constraints and reading behavior in language models.

**1040** — BREAK
**Short Break**
15 minutes

### AFTERNOON / PART 2

**1055** — PITCH + Q&A
**Students' Pitch on BrainHack Projects + Q&A**
Project pitches and discussion.

**1215** — MEAL
**Lunch Break**
1 hour 15 minutes

**1330** — PITCH + Q&A
**Students' Pitch on BrainHack Projects + Q&A**
Afternoon project pitches and discussion.

**1500-1530** — BREAK
**Tea Break & Networking**
Refreshments and informal networking.

**1530** — VISIT
**CoNIC visit and Campus tour**
Guided visit and campus tour.

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DAY 2

**Thu, 2 Jul 2026**

## Day 2

Talks · Workshops · Breaks · Visits

### MORNING / PART 1

**0900** — TALK

Dr Stefano V. Albrecht | Nanyang Technological University, Singapore

**Multi-agent Reinforcement Learning**

MARL foundations, algorithmic ideas, and applications in cognitive science.

**0945** — TALK

Dr Charly Hugo Alexandre Billaud | Nanyang Technological University, Singapore

**Cortical and subcortical surfaces shaping human behaviour**

Brain shape, ageing, cognition, behaviour, and open neuroimaging tools.

**1030** — BREAK

**Morning Tea Break**

15 minutes

**1045-1130** — TALK

Dr Junhong Yu | Nanyang Technological University, Singapore

**The Resting Mind: How Spontaneous Thought Shapes Brain Connectivity, Brain States, and Behavior**

Resting-state thought, connectivity, brain states, and behavior.

**1130** — PRESENTATION

Amanda Lin | National Taiwan University; Ting-Hsin Yen | National Central University; Tiffany Hsin-Yu Lin | NTU

**Presentation by BrainHack School Teaching Assistants**

### AFTERNOON / PART 2

**1200** — MEAL

**Lunch Break**

1 hour

**1300** — WORKSHOP

Dr Kevin Chun-Hsien Hsu | Institute of Cognitive Neuroscience, National Central University

**MEG Workshop**

MEG signals, cognitive/language applications, and data workflow demonstration.

**1400** — BREAK

**Break**

15 minutes

**1415** — WORKSHOP

Dr Niall Duncan's Team | Taipei Medical University, Taiwan

**Open Science Workshop**

Dr Elizaveta Baranova: Unintentional scientific misconduct; Trinh Thi Thuy Ngo: Introduction to multiverse analysis.

**1545-1600** — CLOSING

Prof Josh Goh | National Taiwan University, Taiwan

**Closing Address & Prize Giving Ceremony**

Closing remarks and prize presentation.

# BHS Symposium 2026

## Minds in Motion

Talk titles, speakers, and abstracts

Learning Studio, Experimental Medicine Building, NTU, Singapore

## Day 1 - Talk Titles, Speakers, and Abstracts

DAY 1 TALK

### Dr Hsu Tzu-Yu

National Central University, Taiwan

Title: Neural correlates of switching between internally and externally oriented thoughts

The capacity to flexibly shift between processing external sensory information and engaging in internal thought is essential for everyday functioning. In major depressive disorder (MDD), this balance is disrupted - patients become trapped in repetitive, self-focused rumination at the expense of engaging with their environment. We present converging EEG and fMRI evidence demonstrating that internal and external cognitive states are supported by dissociable neural signatures, and critically, that switching between them is not symmetric. Resting-state neural dynamics linked to rumination emerge specifically during internally oriented states, while transitioning toward external processing recruits additional occipital and subcortical regions that are not equivalently engaged when shifting inward. These findings suggest that the "stickiness" of internal rumination in depression may partly reflect a failure of the neural gating mechanisms required to redirect attention outward. Understanding this switching architecture opens potential avenues for targeted neuromodulation strategies aimed at restoring flexible transitions between internal and external cognition in affective disorders.

DAY 1 TALK

### Dr Byung-Dong Oh

Nanyang Technological University, Singapore

Title: To model human linguistic prediction, make LLMs less superhuman

When we read, we make predictions about upcoming words; these predictions influence our reading behavior. The success of large language models (LLMs), which, like humans, make predictions about upcoming words, has motivated their use as models of human linguistic prediction. Surprisingly, in the last few years, as LLMs' ability to predict the next word has improved, their ability to explain reading behavior has declined. In this talk, I argue that this is because current LLMs can predict upcoming words much better than human readers; this 'superhumanness' is driven by LLMs' extensive training data, stronger long-term memory of training examples, and stronger short-term memory. To further our understanding of human language processing, I advocate for creating LLMs with human-like memory, and outline directions for achieving this goal.

## Day 2 - Talk Titles, Speakers, and Abstracts

DAY 2 TALK

### Dr Stefano V. Albrecht

Nanyang Technological University, Singapore

Title: Multi-agent Reinforcement Learning

Multi-agent reinforcement learning (MARL) enables systems of autonomous agents to learn how to interact and collaborate. MARL is a highly active area of research at the intersection of AI, game theory, and deep learning, with a range of applications in human-AI interaction, multi-robot systems, and social/economic sciences. For cognitive science and brain modelling, MARL methodology could potentially provide new insights and modelling approaches for system-level and neural-level interaction in brains. This lecture will provide a short introduction to the main models and algorithmic ideas at the foundation of MARL. The lecture will be based on the MIT Press textbook "Multi-Agent Reinforcement Learning: Foundations and Modern Approaches", which is freely available at www.marl-book.com.

DAY 2 TALK

### Dr Charly Hugo Alexandre Billaud

Nanyang Technological University, Singapore

Title: Cortical and subcortical surfaces shaping human behaviour

With the popularization of advanced neuroimaging analyses methods, the brain and its structures are frequently represented as 3D mesh surfaces. These representations inform us on how cortical and subcortical regions are shaped, gyrified, curved, elongated, thickening and more. These focal, subtle geometric features evolve with ageing and influence cognition and behaviour. Freely available, user-friendly tools to produce them, and to statistically analyse the relation between brain shape and behaviours will be presented with practical demonstrations on open data from ageing populations.

DAY 2 TALK

### Dr Junhong Yu

Nanyang Technological University, Singapore

Title: The Resting Mind: How Spontaneous Thought Shapes Brain Connectivity, Brain States, and Behavior

What do people think about during resting-state fMRI scans, and how do these thoughts shape brain activity and psychological traits? Although resting-state fMRI is widely used to study brain-behavior relationships, the subjective experiences occurring during rest are often overlooked. Using resting-state scans annotated with thought-content ratings, I show that various dimensions of spontaneous cognition are associated with both static functional connectivity patterns and dynamic coactivation-defined brain states. Furthermore, these thought dimensions significantly mediated relationships between resting-state connectivity and a broad range of behavioral phenotypes. Together, these findings suggest that spontaneous cognition is not merely noise during rest, but meaningfully shapes the spatiotemporal organization of the resting-state brain and explains observed brain-behavior relationships.

## Day 2 - Workshop Titles, Speakers, and Abstracts

DAY 2 WORKSHOP

### Dr Kevin Chun-Hsien Hsu

Institute of Cognitive Neuroscience, National Central University

Title: MEG Workshop

This talk will introduce magnetoencephalography (MEG), covering the basic physics and physiology underlying MEG signals and their application in studying cognition and language processes. In addition, a brief demonstration of the MEG data workflow, from acquisition to analysis.

OPEN SCIENCE WORKSHOP

### Trinh Thi Thuy Ngo

Taipei Medical University, Taiwan

Title: An introduction to multiverse analysis

When analysing data we have a huge array of choices to be made throughout the process. The particular path that we take through these choices influences the outcome that we get. These high degrees of researcher degrees of freedom have the potential to lead to unreliable conclusions being made and reported. I will introduce the idea of a multiverse analysis and explain how this may be one approach to dealing with this reliability issue. I will demonstrate a simple implementation of such an analysis to give participants a foundation for potentially employing such an analysis themselves.

OPEN SCIENCE WORKSHOP

### Dr Elizaveta Baranova

Taipei Medical University, Taiwan

Title: Unintentional scientific misconduct: Ways of creating errors and of avoiding them

As how we do science progresses the range of useful tools available to us always increases. At the same time, the opportunities for us to make a mistake also seems to increase. In this informal workshop I will talk about different potential sources of errors and some principles that can help us avoid them (mostly). This will include our approach to data, code, and new problems that may arise from AI tools.