The Australian Association of Computational Neuroscientists And Neuromorphic Engineers

Sydney

27-29 November 2018

NeuroEng 2018
quantitative brain dynamics across scales

Sydney

Final Program
General Information

Venue
Eastern Avenue, Lecture Theatre 315 (oral presentations) and Room 310 (posters), Camperdown NSW.

Meals
Meals will be served in the Foyer outside Eastern Avenue Lecture Theatre.
- Morning snacks: freshly brewed coffee, selection of teas, fresh fruits and pastries
- Lunch: buffet of warm food, gourmet baguettes/wraps, salads and fruits
- Morning and Afternoon Tea: selection of cookies and cakes
- Welcome Reception (Tuesday, 27th November): canapes and drinks

Conference Dinner and NeuroEng Trivia
Grandstand Function Centre is 7 min walk from the conference venue.
Address: 1 Blackburn Circuit, The University of Sydney NSW 2050.

Wi-fi
Username: NeuroEng
Password: abcd1234

Posters
Posters should be installed either on Tuesday, 27th November or Wednesday 28th November during lunch break.

Oral presentations
Presentation slides need to be uploaded to the central system before the session start. See IT team or your Session Chair for help. No personal laptops can be used for presentations.

21. Steady-state dynamics of the Fractional Leaky Integrate-and-Fire Neurons, Davids Agboola, Michael Breakspear
22. Extracellular spike waveform predicts whether single units recorded in visual cortex are tuned to orientation, Hamish Meffin, Shi Hai Sun, Ali Almasi, Molis Yunzah, Michael R. Ibbotson
23. Electric field generated by electroconvulsive therapy in multiple brain regions using finite element modelling, Azam Ahmad Bakir, Siwei Bai, Donel Martin, Colleen Loo, and Socrates Dokos
24. Neural field theory of the formation of ocular dominance columns in the primary visual cortex, Massoud M. A. Yajadkda, Peter A. Robinson
25. Gamma oscillations organize as propagating patterns in cortical circuits, Yuxi Liu, Xian Long, Pulin Gong
26. Non-linear adaptation improves target salience during behaviourally relevant egomotion in natural scenes, John James, Benjamin S. Cazzolato, Steven Grainger, David C. O’Carroll, Steven D. Wiederman
27. General anaesthesia reduces integrated information in flies, Angus Leung, Dror Cohen, Bruno van Swinderen, Naotsugu Tsuchiya
28. A Biologically Inspired Sound Localisation System based on Instantaneous Correlation, Ying Xu, Saeed Afshar, Ram Kuber Singh, Tara J. Hamilton, Runchun Wang, Andre van Schaik
29. Exploring selectivity of rat retinal ganglion cells through an STC analysis of their temporal electrical receptive fields, Artemio Soto-Breda, Molis Yunzah, Mattas Matuwana, Hamish Meffin, Tatiana Kameneva, Anthony Burkitt, Michael R. Ibbotson
30. Prediction of subjective alertness using an arousal dynamics model, Tahereh Tekieh, Stephen McCloskey, Steven W. Lockley, Peter A. Robinson, Svetlana Postnova
32. Signal Quality of an Endovascular Neural Interface, Sam John, Nicholas Opie, Thomas Oxley, David Grayden
33. Volatility of neural states in task free conditions, Bryan Paton
34. The effect of neural gain on network-level information processing dynamics, Mike Li, Yinxu Han, Matthew Aburn, Michael Breakspear, Russell Poldrack, James M. Shine, Joseph Lizier
35. A Tactomorphic Taxel For Neuromorphic Touch, James Wright, Tara J. Hamilton, Jonathan Tapson, Vaughan Macefield, Andre van Schaik
36. Unique dynamic mechanisms arising from a model of piriform cortex including two classes of principal cells and short term facilitation, Brett Schmerl, John Bekkers, Mark McDonnell
37. Unified Analysis of Global and Focal Aspects of Absence Epilepsy via Neural Field Theory of Corticothalamic System, Dong-ping Yang, Peter A. Robinson
38. Suppression of pathological rhythms in Parkinson’s disease by deep brain stimulation: Determination of effective protocols, Eli Muller, Peter A. Robinson
39. Multimodal gradients across mouse cortex, Ben D. Fulcher, John D. Murray, Valerio Zerbi, Xiao-Jing Wang
**Scientific Program**

**Tuesday, 27 November 2018**

8:00 – 9:00 Registration and Morning snacks

9:00 – 9:30 Welcome and Administration Overview

**Neurofield and large-scale brain modelling**

Chair: Peter A. Robinson


10:50 – 11:20 Morning tea

**Cortical dynamics**

Chair: Anthony Burkitt

11:20 – 12:00 Alain Destexhe (CNRS), “Mean, variance and conductance: 3 keys to unlock in vivo dynamics”

12:00 – 12:40 Stewart Heitmann (VCCR), “Brain Dynamics Toolbox for Matlab”

12:40 – 14:00 Lunch and poster installation

**Methods for large-scale datasets**

Chair: Ben Fulcher

14:00 – 14:40 Joe Lizier (JIDT, USYD), “Empirical analysis of information content and flows in neural data using JIDT”

14:40 – 15:20 Mac Shine (USYD), “The dynamic basis of cognition: an integrative core under the control of the ascending neuromodulatory system”

15:20 – 16:00 Afternoon tea

**Sleep Dynamics**

Chair: Svetlana Postnova

16:00 – 16:40 Andrew Phillips (Monash), “Evolution of sleep-regulatory circuits: A predator-prey model”


17:20 – 19:00 Welcome Reception

**Wednesday, 28 November 2018**

8:00 – 8:50 Registration and Morning snacks

8:50 – 9:40 Introduction

**Cortical microcircuits**

Chair: David Grayden


09:00 – 9:40  Alain Destexhe (CNRS), “Propagating waves in visual cortex and their computational role”

09:40 – 10:10  Anthony Burkitt (UniMelb), “Predictive coding through time: A real-time temporal alignment hypothesis”

10:10 – 10:25  Peter Stratton (UQ), “Neural oscillations and spiking assemblies drive each other in the brain”


10:40 – 10:50  Alan Freeman (USYD), “A model for the development and dynamics of visual orientation selectivity”

10:50 – 11:20  Morning tea

Large- scale brain modelling
Chair: Xiao (Demi) Gao

11:20 – 12:00  Gustavo Deco (UPF), “Brain Songs: Discovering the relevant timescale and richness of repertoire of the human brain”

12:00 – 12:30  Michael Breakspear (QIMR), “Metastable brain waves”


12:45 – 13:00  James Roberts (QIMR), “Large-scale cortical eigenmodes reorganize between infant sleep states and predict developmental outcome in preterms”

13:00 – 14:00  Lunch and poster installation

NeuroEng and Neuroscience-inspired AI
Chair: Peter A. Robinson

14:00 – 14:40  Tara J. Hamilton (Macquarie), “Brain-inspired AI”


15:25 – 15:40  Nao Tsuchiya (Monash), “A moment of conscious experience is very informative”


15:50 – 16:20  Afternoon tea

Mini- talks and Poster session #1
Chair: Tahereh Tekieh

16:20 – 16:40  Poster talks
    Marcus A. Tripplett (poster #7)
    Guozhang Chen (poster #15)

Mehdi Arabizadeh (poster #17)
Yuxi Liu (poster #25)

16:40 – 17:40  Poster session #1; Odd poster numbers to be presented

18:00  Conference Dinner and NeuroEng Trivia (Grandstand Function Centre) see the first page for map and directions

Thursday, 29 November 2018

8:00 – 8:50  Registration and Morning snacks

8:50 – 9:00  Introduction

Learning, Plasticity and neural coding
Chair: Tahereh B. Janvier

09:00 – 9:40  Marta Garrido (UQ), “Shortcuts to the amygdala”

09:40 – 10:10  Tatiana Kameneva (Swinburne), “Electrophysiological clusters: cell types, morphologies and functional characteristics”


10:25 – 10:40  Peter Loxley (UNE), “Neuro-dynamic programming with simple-cell sparse codes”

10:40 – 11:10  Morning tea

Mini- talks and Poster session #2
Chair: Marília M. Oliveira

11:10 – 11:30  Poster talks
    Ali Almasi (poster #14)
    John James (poster #26)
    Ying Xu (poster #28)
    Mike Li (poster #34)

11:30 – 13:00  Poster session #2: Even poster numbers to be presented

13:00 – 14:00  Lunch

Systems neuroscience and cognition
Chair: James Roberts

14:00 – 14:40  Jianfeng Feng (CHN), “Peer into your brain via contiguous scale data”

14:40 – 15:10  Steven Wiederman (UoA), “Robot autonomy derived from dragonfly neurobiology”


15:40 – 16:00  Awards and Conference close