ELEC 6003 NEUROMORPHIC ACCELERATORS

Credit Points 10

Legacy Code 800231

Coordinator Mark Wang (https://directory.westernsydney.edu.au/search/name/Mark Wang/)

Description Problem-oriented thinking and distributed system design are essential for neuromorphic engineers. This unit is designed to provide students with sufficient understanding to neuromorphic processor. Students will be able to implement spiking neural networks by programming neuromorphic processors The lab work and programming assignments focus on different key aspects of programming neuromorphic processor: Neural modelling, Python programming, debugging code and hardware/software co-simulation. The workshops focus on the concrete implementation of neural networks.

School Graduate Research School

Discipline Electronic Engineering

Student Contribution Band HECS Band 2 10cp

Check your HECS Band contribution amount via the Fees (https://www.westernsydney.edu.au/currentstudents/current_students/fees/) page.

Restrictions Must be enrolled in 8124 Master of Applied Neuromorphic Engineering

Assumed Knowledge

Proficient in Python, basic in neural computing, basic in spiking neural networks.

Learning Outcomes

On successful completion of this subject, students should be able to:

1. Design Spiking Neural Networks (SNNs) systems for efficient on-chip computing
2. Implement SNNs using the Neuromorphic Processors f programming framework
3. Critically appraise novel solutions for efficient neural network systems
4. Effectively communicate the significance and impact of neuromorphic processors to non-specialist audience
5. Accurately compile professional lab reports detailing the methodology employed in implementing the SNN architecture

Subject Content

* Architectures of Neuromorphic Accelerators
- Parallel computing
- Differences between Neuromorphic Accelerator architectures and conventional von-Neumann architecture
* Features of Spiking Neural Networks
- Difference between Spiking Neural Networks and conventional numerical computing systems
* Programming frameworks of Neuromorphic processors

Assessment

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are regularly updated, where there is a difference your Learning Guide takes precedence.

Item	Length	Percent	Threshold	Individual/ Group Task
Practical	1000 words	25	N	Individual
Practical	1200 words	30	N	Individual
Applied Project	1500 words	30	N	Group
Presentation	5 minutes	15	N	Individual

Teaching Periods

Spring

Parramatta City - Macquarie St

Day

Subject Contact Mark Wang (https://directory.westernsydney.edu.au/search/name/Mark Wang/)

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=ELEC6003_22-SPR_PC_D#subjects)