

Beginning Artificial Intelligence Through Neuroscience

**REGISTER BY 8 FEB 2021****Saturday, 27 Feb 2021 | 9.00am – 12.30pm****Saturday, 6 Mar 2021 | 9.00am – 12.30pm****This course will be held as two half-day online sessions via Zoom.****Course Reference Number:** SkillsFuture Singapore (SSG)-Funded (CRS-N-0053428)

Neuroscience helped inspire deep learning, which is the basis of AI technologies such as speech recognition by personal digital assistants and face recognition for access control, and is being developed for applications such as assisted interpretation of medical images and scene analysis by self-driving cars.

Organised by the Department of Physiology, NUS Yong Loo Lin School of Medicine, this course introduces the relevant neuroscience, including the function and connectivity of the cerebral cortex, which is used to motivate the architecture of deep learning artificial neural networks. Participants will learn the mathematical and statistical concepts needed to fit models to data; beginning with simple examples such as linear regression and binary classification, followed by the application of these principles to train deep learning models.

There will be opportunities for participants to experience hands-on coding with some common AI tools and the potential dangers of AI will also be examined and discussed.

At the end of the course, participants will be able to:

- Appreciate fundamental AI concepts for managing AI technology
- Acquire basic coding skills for constructing simple AI systems
- Build and deploy a simple deep learning model

Who Should Attend

Allied health professionals, nurses, doctors, teachers, managers, data analysts, IT professionals, technology officers, technical advisors, and anyone who is interested in gaining a basic understanding of AI.

**For Self-Funded Participants****CLICK HERE TO REGISTER**

(Under Member of Public; Short Course)

For Enquiries & Corporate RegistrationsContact Ms Evelyn at nusmedcet@nus.edu.sg

Please note that the scheduled course run will proceed only if the minimum class size is met.

Beginning Artificial Intelligence Through Neuroscience

Saturday, 27 Feb 2021 & Saturday, 6 Mar 2021

(REGISTER BY 8 FEB 2021)

Course Outline

Overview of AI Types and Applications

- Turing test, artificial general intelligence
- Symbolic AI, GOFAI, expert systems
- Machine learning, deep learning, reinforcement learning

Training Artificial Neural Networks

- Introduction to calculus
- Fitting a straight line to data
- Binary classification
- Error minimization by gradient descent
- Training an artificial neural network by gradient descent

Fooling and Being Fooled by AI

- Correlation is not causation
- Bias
- Collusive pricing
- Explainability, interpretability
- Vulnerability to noise, distortion, and adversarial examples
- Neural network uncertainty
- Generative adversarial networks, deepfakes, GPT-3

Biological and Artificial Neural Networks

- Biological neurons and neural networks
- Edge detection in the visual system
- Object recognition in the brain
- Simple neuron models
- Artificial neural networks

Hands-On Coding Workshop

- Simple machine learning models
- Training and deploying a deep learning neural network



Course Requirements

A background knowledge in calculus at the level of H1 or AO-level mathematics, or equivalent will be helpful. However, those who have not studied calculus are also welcome to register, as we will give a beginner's introduction to calculus during the course.

For Self-Funded Participants

CLICK HERE TO REGISTER

(Under Member of Public; Short Course)

For Enquiries & Corporate Registrations

Contact Ms Evelyn at nusmedcet@nus.edu.sg

Please note that the scheduled course run will proceed only if the minimum class size is met.



Beginning Artificial Intelligence Through Neuroscience

Saturday, 27 Feb 2021 & Saturday, 6 Mar 2021

(REGISTER BY 8 FEB 2021)

Trainer's Profile

Dr Andrew Tan Yong-Yi

Assistant Professor

Department of Physiology, NUS Yong Loo Lin School of Medicine

Andrew is a member of the Department of Physiology, the Healthy Longevity, and the Cardiovascular Disease Translational Research Programmes at NUS Medicine as well as at the Neurobiology Programme of the Life Sciences Institute. He uses measurements of electrical activity within single neurons of living animals and computational simulations of neural networks, to study how cortical processing and plasticity enables us to recognize complex sounds and learn new skills. He hopes his research will contribute towards improving speech comprehension by cochlear implant users, and better stroke rehabilitation.

Course Fees

	International Participants	Singapore Citizens ¹		Singapore PRs	Enhanced Training Support for SMEs ³
		39 years old or younger	40 years old or older ²		
Full Course Fee	\$850.00	\$850.00	\$850.00	\$850.00	\$850.00
Less: SSG Grant Amount	-	\$595.00	\$595.00	\$595.00	\$595.00
Nett Course Fee	\$850.00	\$255.00	\$255.00	\$255.00	\$255.00
7% GST on Nett Course Fee	\$59.50	\$17.85	\$17.85	\$17.85	\$17.85
Total Nett Course Fee Payable, Including GST	\$909.50	\$272.85	\$272.85	\$272.85	\$272.85
Less Additional Funding if Eligible Under Various Schemes	-	-	\$170.00	-	\$170.00
Total Nett Course Fee Payable, Including GST, after additional funding from the various funding schemes	\$909.50	\$272.85	\$102.85	\$272.85	\$102.85

¹All self-sponsored Singaporeans aged 25 and above can use their \$500 SkillsFuture Credit to pay for the course. Visit <http://www.skillsfuture.sg/credit> to select the course.

²Mid-Career Enhanced Subsidy (MCES) - Singaporeans aged 40 and above may enjoy subsidies up to 90% of the course fee.

³Enhanced Training Support for SMEs (ETSS) - SME-sponsored employees (Singapore Citizens and PRs) may enjoy subsidies up to 90% of the course fee.

For Self-Funded Participants

CLICK HERE TO REGISTER

(Under Member of Public; Short Course)

For Enquiries & Corporate Registrations

Contact Ms Evelyn at nusmedcet@nus.edu.sg

Please note that the scheduled course run will proceed only if the minimum class size is met.