

DEPARTMENT OF COMPUTER SCIENCE

SEMINAR

2024 SERIES

NeuroAI: Neuroscience Can Catalyze Advanced AI Technologies and Key Applications in Data Science

DATE & TIME

10 SEP 2024 (TUE) 4:00 – 5:00 PM

VENUE

AAB705, Academic and Administration Building,
Baptist University Road Campus



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ABSTRACT

The brain is the most intelligent system we have ever known so far. It is clear that the existing deep learning system still goes far behind the human brain in many important aspects such as efficiency, interpretability, memory, and robustness. For example, to train a large language model to a practical point, enormous storage space and considerable power need to be supplied. In contrast, a human brain performs its incredible feat by managing billions of neurons and coordinating trillions of connections at extremely low power (<presumably 20W) and in a small size. Given the incredible capability of the human brain, neuroscience has been constantly supporting deep learning as a think tank and a validation tool, e.g., inspiring the invention of neocognitron, the pioneering work of convolutional models. NeuroAI is an emerging field, advocating that revealing the basic elements of intelligence can catalyze the next-generation AI, although AI would usually follow their own paths after drawing inspiration from neuroscience. Drawing inspiration from neuroscience is the first-principled thinking that breaks down the issues of intelligence into their most basic and fundamental questions and hopefully, these questions can be fully/partially addressed by decoding the inner-working mechanisms of our brain, towards the goal of compensating the deficiencies of the existing networks in efficiency, interpretability, and other important issues. In this talk, I will discuss 1) how to prototype novel deep learning foundational models based on principles of brain intelligence, 2) analyze the computational properties of neuro-inspired AI models like efficiency and interpretability, and 3) apply neuro-inspired models in mission-critical data science applications.



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