Sleep in Biological and Artificial Neural Networks

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12:00 – 13:00 PM
BMI Classroom 4004
Woodruff Memorial Research Building

or

Join us on Zoom link:
https://zoom.us/j/93923863923
Meeting ID: 93923863923

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Abstract: Sleep is observed across species and seems essential for life. Yet, we are still trying to identify its function and how the complementary role of awake and sleep phase impacts biological and cognitive functions. In a series of work, we identify some of the neural mechanism that result in spontaneous activity during different sleep stages and how replay emerges and its impact on learning and memory. Further, we take inspiration from the neural mechanism of sleep to develop an algorithm for deep learning. The sleep-like state implemented for deep neural networks improved continual learning, and generalization under low data and noisy conditions.

Bio: Dr Krishnan is a computational scientist focusing on neuroscience and Artificial Intelligence (AI). His current interest is in developing AI methods for computational science problems across many domains. He is a computational neuroscientist by training, with past work spanning across a wide range of computational modeling and AI methods. His current focus is on leveraging recent advances in deep learning to develop better grounded and aligned AI systems and enable scientific discovery. He is also interested in applying AI to develop better models of the brain. In the past, he developed computational modeling to address several open questions in neuroscience, such as the origin of sleep stages, memory consolidation, seizure termination, and resting-state activity. Uncovering principles from neuroscience has led to the development of algorithms for continual learning, generalization, and neuro-symbolic methods in deep learning and AI.