Brain-Inspired World Model Learning for Next-Generation Artificial Intelligence

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Abstract
My research agenda revolves around deciphering how the brain builds and uses its internal model of the world. This topic fascinates me for two reasons: First, world model learning is an exciting, yet unresolved, neuroscientific question. Second, reengineering this process in artificial neural networks could lead to intelligent systems that surpass current technology in reliability, speed, and efficiency in terms of data requirements and energy consumption. With the help of the CIDAS Fellowship I plan to integrate a recently developed model for hippocampal world models, Cloned-Structured Causal Graphs, both into deep learning architectures and spiking neural networks. This work aims at pushing the boundaries of current AI systems and increase our understanding of information processing in the brain.