Department of Physics

UNIVERSITY OF OXFORD

Machine Learning and Physics Seminar Series

Thursday, 21 November 2019 at 2.30pm
Dennis Sciama Lecture Theatre, Denys Wilkinson building

Learning structured models of physics

Dr Peter Battaglia
DeepMind

This talk will describe a class of machine learning methods for reasoning about complex physical systems. The key insight is that many systems can be represented as graphs with nodes connected by edges. I'll present a series of studies which use graph neural networks--deep neural networks that approximate functions on graphs via learned message-passing-like operations-- to predict the movement of bodies in particle systems, infer hidden physical properties, control simulated robotic systems, and build physical structures. These methods are not specific to physics, however, and I'll show how we and others have applied them to broader problem domains with rich underlying structure.

Peter Battaglia is a research scientist at DeepMind. He earned his PhD in Psychology at the University of Minnesota, and then was a postdoc and research scientist in MIT's Department of Brain and Cognitive Sciences. His current work focuses on approaches for reasoning about and interacting with complex systems, by combining richly structured knowledge with flexible learning algorithms.