

SEMINAR

Transformers, graphs, and hypergraphs

Taliesin Beynon

Friday, 28 July 2023 @ 14h00 SAST

Venue: Physics Seminar Room, Stellenbosch University, and online**ABSTRACT**

Graphs are general-purpose data structures with widespread application. Hypergraphs are lesser-known structures that model a much larger family of situations and structures in the human world. Hypergraph rewriting systems are discrete dynamical systems that can serve as discrete counterparts to the widely-used coupled ODEs, and I'll give some nice examples. But we can generalize even further, using category theory, to automatically obtain a rich family of modeling tools that admit efficient computer manipulation. I'll explain the underlying ideas, with a smattering of category theory, and talk about potential applications to AI.

BIOGRAPHY

Taliesin (Tali) Beynon graduated from UCT in 2008 with an Honours in pure mathematics. He joined Wolfram Research in 2010 and led the Advanced Research Group to enhance the Mathematica language with data science, visualization, and deep learning functionality. In 2018 he left Wolfram to pursue research in mathematics and neuroscience. He regularly teaches at the Deep Learning Indaba. He's currently mapping out a research program for a PhD in the intersection between neuroscience, AI, and mathematics, that involves blending higher algebra and hypergraphs.

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