



RESEARCH2REALITY

Shining a light on research & innovation.

Going Deep Into the Human Genome

An Interview with Professor Brendon Frey, Computer Engineer
CIFAR Senior Fellow, Learning in Machines & Brains
University of Toronto

What does artificial intelligence mean today?

So one of the big breakthroughs in artificial intelligence in the last five years has been in an area called deep learning. And old AI, was AI where it's very symbolic-oriented, it's about if-then statements or logic, but deep learning is all about figuring out what to make of data. So you just provide a lot of data to the system and then the system learns deep, complicated architectures on how to understand that data: how to find patterns in the data, and how to do useful things with it. But one of the most exciting applications of deep learning is genomics, figuring out how to connect genotype to phenotype, close this genotype-phenotype gap. No human or group of humans can ever understand the genome and how it encodes life, we need super-human AI to figure that problem out.

What is the Vector Institute?

Today's very exciting, we're launching the Vector Institute for artificial intelligence here in Toronto, and this is going to be a one-of-a-kind institute really in the world, we're going to bring together top AI researchers, both young ones and all the way through to senior ones, and also a big part of this institute is going to be entrepreneurial activities. So spinning out companies, working with existing companies in Toronto and all around Canada.

What are you most excited about?

What I am most excited about right now is my group at Deep Genomics is putting together a system, an AI system, that really is allowing us to peer at your DNA, look at your mutations and figure out what's wrong and how to treat the disease. So we're actually developing new therapies at Deep Genomics, and that's what I'm most excited about.

TODAY'S RESEARCH. TOMORROW'S REALITY.