Computer Science
Robert Stewart Distinguished Lecture

Date: Friday, March 8, 2019
Time: 4:00pm
Location: 2055 Hoover

What Needs to be Added to Machine Learning?

Supervised learning is a cognitive phenomenon which has proved amenable both to theoretical analysis as well as exploitation as a technology. However, not all of cognition can be accounted for directly by supervised learning. The question we ask here is whether one can build on the success of machine learning to address the broader goals of artificial intelligence. We regard reasoning as the major component of cognition that needs to be added. We suggest that the central challenge therefore is to unify the formulation of these two phenomena, learning and reasoning, into a single framework with a common semantics. With this one would aim to learn rules with the same success that predicates can be learned. We discuss how Robust Logic fits such a role as a theoretical framework. We also discuss the challenges of testing this experimentally on a usefully significant scale.

Leslie Valiant was educated at King's College, Cambridge; Imperial College, London; and at Warwick University where he received his Ph.D. in computer science in 1974. He is currently T. Jefferson Coolidge Professor of Computer Science and Applied Mathematics in the School of Engineering and Applied Sciences at Harvard University, where he has taught since 1982. Before coming to Harvard he had taught at Carnegie Mellon University, Leeds University, and the University of Edinburgh.

His work has ranged over several areas of theoretical computer science, particularly complexity theory, learning, and parallel computation. He also has interests in computational neuroscience, evolution and artificial intelligence and is the author of two books, Circuits of the Mind, and Probably Approximately Correct.

He received the Nevanlinna Prize at the International Congress of Mathematicians in 1986, the Knuth Award in 1997, the European Association for Theoretical Computer Science EATCS Award in 2008, and the 2010 A. M. Turing Award. He is a Fellow of the Royal Society (London) and a member of the National Academy of Sciences (USA).

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