"Toward a Computational Theory of Intelligence"

Dr Richard S. Sutton

**iCORE Chair, Reinforcement Learning and Artificial Intelligence
University of Alberta**

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HOST LOCATION: Biosciences 587, University of Calgary

Interactive videolinked locations
Lethbridge: PE256, University of Lethbridge
Edmonton: Telus Centre Tiered Classroom, University of Alberta

Abstract

Reinforcement learning is an approach to understanding and designing intelligent systems, now about 20 years old, that was inspired by ideas from psychology and operations research. This unlikely combination has produced both better algorithms for solving large optimization problems and a compelling new computational theory about how the human mind operates. The main elements of this theory would be familiar to any operations researcher: Markov decision processes, rewards, control policies, value functions, and system models. The contribution of psychology, and what makes reinforcement learning novel, is the idea of benefiting from an individual decision maker's experience, the specific trajectory of its life. New algorithms based on this idea have improved over conventional methods in applications such as controlling robots, piloting helicopters, dispatching elevators, and managing inventories and stock portfolios. Many applications are too large to permit even one iteration of conventional solution methods such as dynamic programming. This talk will present the key ideas of reinforcement learning and one large but easily understood example - a backgammon-playing program that learned from self-play to become better than any other machine, and apparently better than any person.

Biography

Richard S. Sutton is a fellow of the American Association for Artificial Intelligence and co-author of the textbook Reinforcement Learning: An Introduction from MIT Press. Before coming to the University of Alberta, he worked in industry at GTE Laboratories and at AT&T Laboratories, and in academia at the University of Massachusetts. He received a PhD in Computer Science from the University of Massachusetts in 1984 and a BA in Psychology from Stanford University in 1978.