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Information Science and Technology Seminar Series

David Wolpert
Los Alamos National Laboratory

"From Game Theory to Game Engineering"

Wednesday, January 18, 2012
3:00 - 4:00 PM
TA-3, Bldg. 1690, Room 102 (CNLS Conference Room)

Abstract: In this talk I present recent work on combining game theory, statistics, and control theory. This combination provides new techniques for predicting / controlling any system comprising humans, human groups (e.g., firms, tribes), and / or adaptive automated systems (e.g., reinforcement learning robots).

As illustrations, I will focus on three projects:

1) Suppressing flutter in an airplane wing by controlling a set of autonomous micro-flaps at its trailing edge.

2) Predicting the behavior of an interacting attacker and defender of a cyber-physical system, to enable improved design of such systems.

3) First raising taxes in a human economy, and then lowering them back to the starting values, to steer the economy to a Pareto superior equilibrium.

Biography: David Wolpert is a Scientist 5 who recently joined CCS-3. Previous to joining Los Alamos he was a Senior Computer Scientist at NASA Ames Research Center where he formed the Collective Intelligence group. He has also been a consulting professor in Stanford's Aeronautics and Aerospace Department, and external faculty at several institutions, including the Santa Fe Institute. Last year he was the Ulam scholar at the Center for Nonlinear Studies in Los Alamos.

His current primary research areas are game theory (both experimental and theoretical), optimization, and Monte Carlo methods. His particular focus is on using machine learning technology to improve those disciplines. He also does work in information theory, complexity, and the foundations of physics and inference.

Before coming to NASA he was a Research Manager at IBM Almaden Research Center. He had come to IBM from TXN Inc., a data-mining firm where he was Director of Research. Before that he was a postdoc at the Santa Fe Institute and the Center for Nonlinear Studies at Los Alamos. His degrees are in physics, from the University of California Santa Barbara, and Princeton University.

He is the author of two books, three patents, close to one hundred refereed papers, and numerous awards.

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