FREE PUBLIC LECTURE AT THE 2013 AMERICAN CONTROL CONFERENCE

How We Interact with Robots, Feedback Loops, and Autonomous Systems: Historical Perspectives and a Look Forward

Professor **David A. Mindell**
Massachusetts Institute of Technology

Abstract: Human operations in technological systems are becoming "remote" or "automated" in a broad variety of arenas. What are these new technologies doing to us? What becomes of the human role in critical activities like warfare, exploration, or transportation when more and more of the critical tasks seem to be done by machines? This talk focuses on these phenomena in extreme environments where human and technical actions are real-time and life-critical such as military robotics, undersea exploration, spaceflight, and aviation. In each, the stakes are high, professional identities tend to be strong and well-defined (e.g. pilots, explorers and astronauts), and technological "aids" to human performance deployed with great intensity. Drawing on historical and present-day examples, the talk examines how remote and automated systems have not eliminated, but rather shifted human presence in space and time, and the implications of those shifts for human identity and experience. An historical overview of control systems in the twentieth century shows how such shifts in human presence co-evolved with control theory, digital computing, and real time controls. Examples are presented from military control systems and aviation. The Apollo lunar landings are presented in depth as the culmination of these twentieth century trajectories and a founding moment in modern, digital controls linked in extensive social networks. Present day examples are presented, including operating the Predator and Reaper remotely-piloted aircraft, undersea remote- and autonomous- vehicles, and aircraft cockpit controls. Some prospects are offered about the future co evolution of control systems and human roles in automated cars, surgery, and other arenas.

Biography: David A. Mindell, a historian and electrical engineer, is the Dibner Professor of the History of Engineering and Manufacturing and Professor of Aeronautics and Astronautics at MIT. He is an expert on the history and technology of human/machine relationships in complex technological systems. Mindell's current research involves examining human/machine relationships in extreme environments, including human spaceflight, military robotics, undersea exploration, aviation, and surgery, with a goal toward developing general models of networks of humans and machines.

Additional information can be found at
http://a2c2.org/conferences/acc2013/plenary.html

Time and Location: Monday evening, 6:30pm-7:30pm, June 17, 2013 Grand Ballroom, Renaissance Washington, DC Downtown Hotel, Washington, DC