LCDR Joseph V Cohn

LCDR Joseph Cohn is an Aerospace Experimental Psychologist (AEP) in the U.S. Navy's Medical Service Corps and serves as a Program Manager at the Defense Advanced Research Projects Agency (DARPA), in the Defense Sciences Office. His efforts are focused on developing projects that emphasize maintaining human performance/human effectiveness and optimizing the symbiosis between humans and machines. LCDR Cohn has a doctorate in neuroscience from Brandeis University and a bachelor's degree in biology from the University of Illinois, Urbana-Champaign. He has authored more than 60 publications, served as guest editor on three professional journals, is co-editing a three-volume series of books focusing on all aspects of training system development, and is co-editing a book on warfighter performance. In addition to his military decorations, he received the Navy Modeling and Simulation Award, Training Category, from the ASN (RD&A) Chief Systems Engineer and was chosen as the Potomac Institute for Policy Studies' Lewis and Clark Fellow, exploring the legal and ethical issues associated with using performance enhancing technologies and developing policies and guidelines to ensure their effective —and appropriate—use.

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Representing Human Behavior: Where to next?

Advances in neuroscience have contributed to a strong growth in understanding how the human brain effectively processes information leading to behavior. Traditional approaches to representing human behavior for such uses as informing more effective human machine symbiotic systems, have focused on engineering or machine learning techniques to establish couplings between humans and their machines. For example, many of the cognitive architectures that are intended to allow the machine to infer human intention are based on computer processing metaphors, not on actual brain dynamics. This is a partly a result of the levels of technology available to understand and represent the processes through which the human brain transforms information into action. Until very recently, neither the imaging technologies nor the analytic capabilities were available to truly link actual brain activity to behavior. As a result, when one wished to represent human behavior, one was forced to do so using observed behaviors as a starting point, and building predictive models of human behavior on these observed behaviors.

One important goal of neuroscience is to develop techniques for representing the link between observed behavior and underlying neural action. Just as understanding the equations of motion provides a much broader set of capabilities than inferring these equations from a limited set of observations, so too understanding and modeling the dynamics of neural activity as it leads to behavior should provide a much richer and more robust set of models than those based on the actual observed behavior alone. Today, advances in neuroscience and engineering provide the basis for building these 'equations of motion' for the brain and for using brain-based techniques to create and maintain very robust human behavior representations.
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