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William Regli DARPA

“A New Type of Thinking”



Wednesday, September 27, 2017

Noon-1pm

CIT 477 Lubrano Conference Room

Abstract: Albert Einstein penned an essay for New York Times that appeared on May 25th, 1946 where he asserted that “A new type of thinking is essential if mankind is to survive and move toward higher levels.” While his essay was addressing the post-war climate and the threat posed to our species by nuclear weapons, the same sentiment certainly applies today across the daunting landscape of technological threats to peace and security around the world. My thesis is that we are, collectively, seeing the development of the architecture and toolbox for this “new type of thinking.” This new thinking is no longer confined to human brains, but is a joint human-machine effort that enables us to sense and act in the world in ways that are increasingly unimaginable to us. In this convergence, the fundamental question that emerges is how to best optimize the allocation of human attention in this new type of thinking.

This talk will attempt to describe the architecture of this new type of thinking and its properties. Using historical examples, I will argue that this evolution of thought is the next step in a continuum of human innovation. What makes this next step unique, however, is the role of machines as partners rather than as mere tools and the unfathomable quantities of data that we can now extract from our exquisite abilities to sense the world. Taken together, we must reimagine known problems in fundamentally different ways---ways that shift the nature and complexity of the required thinking from the exclusive realm of human agents to a joint human-machine endeavor. We will attempt to present an architecture for these new forms of thinking and frame implications for science and engineering. The talk will conclude by speculating with some candidate problems and how we might frame them.

Dr. William Regli is currently Special Assistant to the Director at the Defense Advanced Research Projects Agency. Prior to this, he was Deputy Director, and then Acting Director, of the Defense Sciences Office at DARPA (2014-2017) and a Professor of Computer and Information Science at Drexel University. Prior to joining DARPA in September 2014, he was Senior Associate Dean for Research and Scholarly Activities for the Drexel College of Computing and Informatics and Scientific Adviser to the Defense Programs Office of the U.S. Department of Energy's (DoE) National Nuclear Security Administration (NNSA) in the areas of information technology and advanced manufacturing. Dr. Regli is a computer scientist who has focused his career on interdisciplinary and use-inspired problems spanning engineering, artificial intelligence and computational modeling and graphics. Dr. Regli holds a Doctor of Philosophy degree in Computer Science from the University of Maryland at College Park and Bachelor of Science degree in Mathematics from Saint Joseph's University.