The Scientist as User
Jeff Shrager

Interaction Analysis (IA) is the science of human interaction with other humans, natural settings, and artifacts, such as complex engineered systems. In the latter case, the goals are usually those of improving efficiency and safety. IA draws together a wide range of methodologies including cognitive science, time-and-motion studies, ethnography, and the analysis of big data such as social graphs, to identify problems that arise in interaction, and to offer guidance toward their resolution.

Scientists are particularly interesting subjects for IA as they are particularly prone to a phenomenon called "The Paradox of the Active User", in which users are so focused on "just getting their data and going home", and their data collection time is so valuable and scarce, that they are willing to put up with a greater level of usability inconvenience and chaos than typical users. Unfortunately, this can lead to cascading complexity, and potentially catastrophic failures.

Implementation of design and engineering practices, and product management processes, can improve the efficiency, stability, and safety of scientists' interaction with complex systems, and thereby minimize the potential for catastrophic failures. Some of these practices are simple, requiring only improved communications and user training. Some are more complex, involving technologies such as real time user monitoring, all the way up to intelligent user interfaces. In this presentation we will review the theoretical framework that we are using to apply Interaction Analysis to understand the LCLS scientists as users, and our plan for deploying IA methods and technologies at LCLS and LCLS-II.

LCLS research is performed in collaboration with Devangi Vivrekar and Paul Fuoss.

Biography:

Jeff Shrager, PhD, is a computer scientist, cognitive scientist, and molecular biologist. He teaches Interaction Analysis in the Symbolic System program at Stanford. Jeff's research focuses on the analysis and design for special categories of user, especially scientists and other high expertise users. Although Jeff has mostly worked in biomedical domains, his first paying job was with the Paul Scherrer Institute -- which at the time was called SIN -- developing programs in support of the cyclotron control and data acquisition operating systems. Since then, Jeff has worked on both user and instrument sides in domains related to drug discovery, marine microbiology, computational genomics and systems biology, cancer, dynamical systems, and aviation and air traffic control systems.