

Sandia National Laboratories

Sandia National Laboratories (SNL) is a multi-program, national security laboratory with explicit missions in nuclear weapons, air and space surveillance and reconnaissance, cyberspace, global nuclear assurance and security, global chemical and biological dangers, and a secure and sustainable energy future. Because each of the complex systems associated with these missions are also sociotechnical, SNL endeavors to design them with the human as a key element— either as a supervisor/operator, system component, subject, or an inspiration. Understanding humans in these roles is critical to designing effective systems and processes from theory to end-user. As both a research and engineering laboratory, Sandia can move products from concept to component to completion.

Though Enhanced Decision-Making and the Human Factors groups lead the charge, more than 130 people in 14 different Centers throughout SNL conduct research and/or apply techniques to maximize performance of human and human-machine systems. SNL human dimension work integrates multiple disciplines including but not limited to psychology and psychophysiology, neuroscience, sociology, economics, ethics, systems-and nano-biology, physics, engineering, computer science, and data analytics.

Interdisciplinary teams strive to integrate research efforts with mission need to produce new capabilities. For example, SNL applies its work in basic visual cognition and expert/novice behaviors to develop effective data visualization and analysis tools for analysts and operators in air and space surveillance, cyber security and public safety. Overarching interests include: understanding and augmenting human performance from biophysical, cognitive, behavioral and HMI perspectives, neuromorphic computing, systems resilience in areas like power grid and nuclear security operations, risk identification and mitigation in high consequence/low probability environments, and developing effective learning/training paradigms.

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