Center for Network-Centric Cognition and Information Fusion (NC2IF)

http://ist.psu.edu/nc2if

At the center of the NC2IF is the Extreme Events Lab (EEL), which is also home to the newly designated Red Cell Analytics Lab, or RCA Lab. Designed primarily to support research and experimentation in the areas of hard and soft data fusion, visualization, and sonification, the EEL/RCA Lab features a single-wall, 3D visualization facility, four large wall-mounted HD LCD displays, 2D and true stereoscopic 3D projectors, a stereoscopic 3D Head-Mounted Display (HMD), haptic input devices, motion and acoustic sensors, various video and still cameras, several MacPro workstations, a conference area with a 54" HD LCD TV, and 8 professional-quality loudspeakers for experimentation with immersive 3D sonification.

Located in Room 211 of the IST building, this facility is intended to allow researchers to run end-to-end experiments that improve situational awareness and enhance their ability to optimally leverage all available sensors, human observers, and technology in order to escape "information overload" and extract the true meaning hidden within the vast mountains of available data. The laboratory includes a central data analysis and visualization facility with associated computing and communications facilities, numerous high-end computer work

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OVERVIEW

The Center for Network-Centric Cognition and Information Fusion (NC2IF) explores the information chain from energy detection via sensors and human observation to physical modeling, signal and image processing, pattern recognition, knowledge creation, information infrastructure, and human decision-making—all in the context of organizations and the nation. The work of NC2IF researchers focuses on the gap between the collection of reports and data in computer systems and the knowledge and decisions in the minds of computer users.

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stations and a host of analytic software, including ArcGIS, Analyst Notebook, GeoSuite, and numerous open-source software packages.

The centerpiece of the EEL is the Cave, a 3D stereoscopic visualization and analysis facility providing the capability for immersive 3D visualization of data including situation displays and advanced displays of complex data. The 3D environment provides a stereoscopic view of data; providing the analyst multi-perspective viewing for improved situational awareness.

The NC2IF is currently involved in three major data fusion research initiatives:

- Multidisciplinary University Research Initiative (MURI) for "Unified Research on Network-based Hard/Soft Information Fusion" issued by the U.S. Army Research Office (ARO);

- Independent Research and Development (IR&D) project funded by Raytheon in support of the National Geospatial Agency (NGA) to explore innovations in data fusion;

- Development of information fusion concepts for Cyber Situation Awareness in support of an ARO MURI program on cyber-situation awareness.

The Red Cell Analytics Lab was added to the NC2IF in the Spring 2012 semester. The RCA Lab was established to promote the study of security and risk through the research and practice of red cell methodologies and structured analytic techniques.

The RCA Lab utilizes the same suite of analytic tools described above to explore and develop red-cell tactics, techniques and procedures. Membership to the RCA Lab is open to IST and SRA students in good standing and to other academic units across Penn State and the Big Ten. RCA Lab members have conducted red cell analysis for various agencies including the Penn State Police Department, Penn State Intercollegiate Athletics and the Marine Corps Warfighting Lab. Several agencies have offered support to current and future RCAL research including the Potomac Foundation, Office of the Secretary of Defense for Intelligence (OSDI), Penn State Office of Emergency Management, Ernst and Young, Deloitte, and Pennsylvania Power and Light.

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