

S&T Campaign: Human Sciences Human Capability Enhancement Augmentation

Jeff Hansberger
(256) 273-9895
Jeffrey.t.hansberger.civ@mail.mil

Research Objective

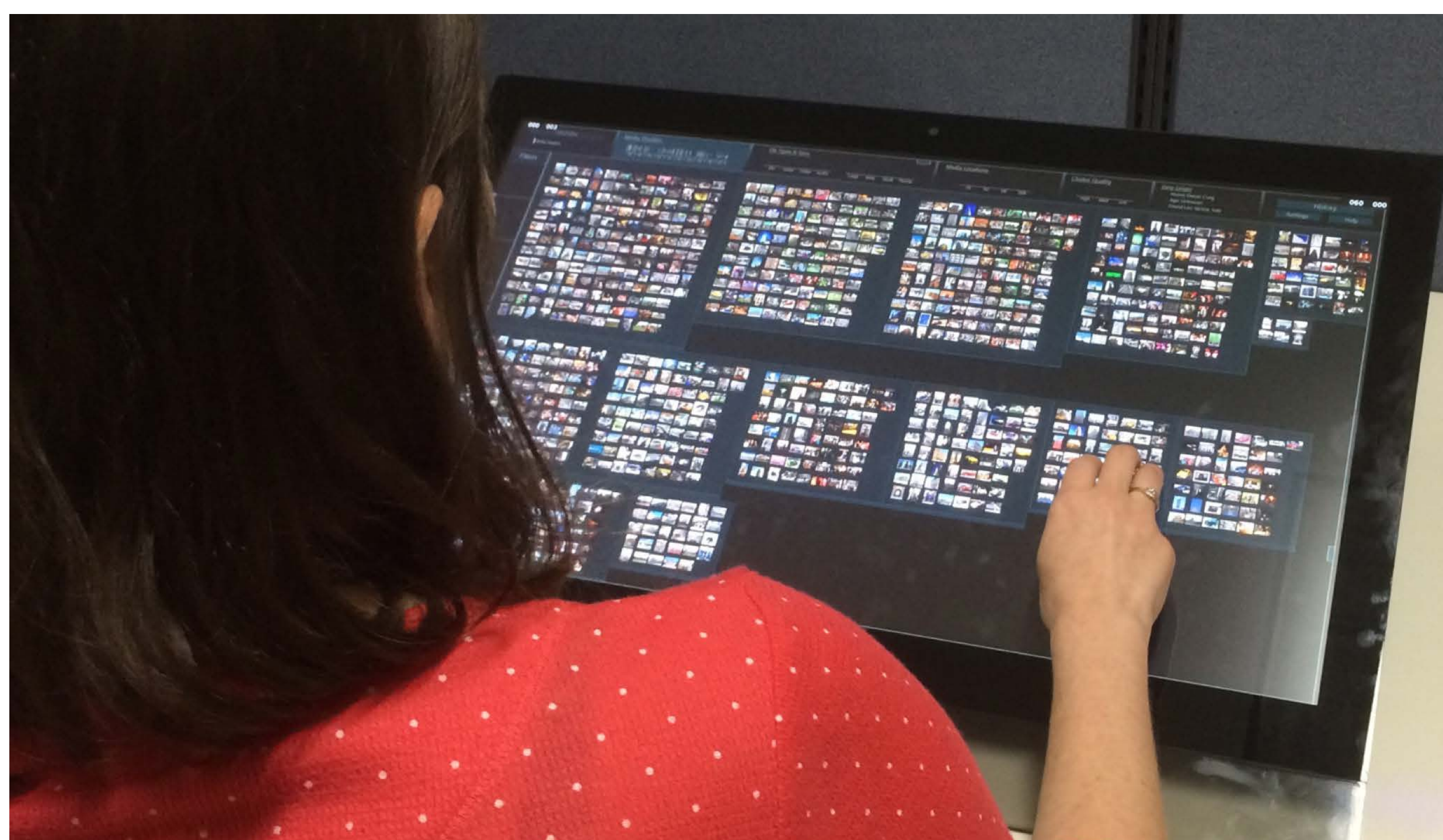
- Integrate gestures, speech, and eye gaze input for a multi-modal interface for visual information seeking domains
- Creation of a prototype system that integrates multimodal user interfaces (Uis) and computer vision



User interface design for the touch screen map view

Challenges

- Design 2 types of UIs: a touch interface and a 3D UI using a head-mounted display (HMD)
- Establishing gesture recognition hardware for the hands that is not camera based, is not cumbersome, and has little lag
- Integration of speech, gesture, and eye gaze input into 1 cohesive user experience



Zoomable User Interface (ZUI) designed for easier navigation for large image collections

ARL Facilities and Capabilities Available to Support Collaborative Research

- Immersive Integration Systems Center/Human Interface Innovation Lab
- 55" capacitive touch screen
- Multi-sensor eye tracking and HMD mounted eye-tracking
- Inertial measurement unit (IMU) motion capture suits and gloves
- Development of a low fatigue type of gesture
- Integration of science, engineering, and design approaches
- Our supported gestures produce similar fatigue and exertion levels as keyboard and mouse use



3D UI with input from speech, gestures, and eye gaze

Complementary Expertise / Facilities / Capabilities Sought in Collaboration

- Engineering expertise with low profile IMU-based glove sensors
- Machine learning approaches to hand gesture recognition with very little lag
- Speech recognition for both speech commands and speech-to-text
- Computer vision algorithms for automatic target detection
- Information visualization expertise to explore new ways of presenting information on large image collections