The goal of the Information Presentation Directed Research Project (DRP) is to address design questions related to the presentation of information to the crew on flight vehicles, surface landers and habitats, and during extra-vehicular activities (EVA). Designers of displays and controls for exploration missions must be prepared to select the text formats, label styles, alarms, electronic procedure subtasks, within the Information Presentation DRP are: 1) Controls, 2) Displays, 3) Procedures, and 4) EVA Operations.

The unique environmental conditions encountered by crewmembers on space missions (vibration, varied g-levels, vacuum requiring pressurized TCCDs) must be specially designed to function under the variable, harsh conditions of space. Display designers sometimes have to use vertical text when real estate is limited.

Test battery
One of the first goals of the IP project was to develop a computerized test battery that could be used to evaluate a number of different types of cursor control devices. The test battery provides a standard methodology for measurement, and will be of use to any researcher interested in evaluating cursor control devices.

This confirms that horizontal alignment is the preferred type for display of labels.

Test movement study: In addition to investigating cursor control device performance, the behavior of the user on the computer screen is an area of investigation as well. An upcoming study will experimentally compare task performance with a cursor in the following modes: continuous, discrete, greatly well. Future studies will examine advantages and disadvantages of type of cursor movement under different environmental conditions: vibration, microgravity. These studies will provide recommendations for cursor movement under different environmental conditions.

PROCEDURES

- An Electronic Procedure Viewer (EPV) is one of the most operationally critical interfaces for next-generation crewed space vehicles, particularly for maximeum life isolation and recovery operations.
- We recently completed a human-in-the-loop evaluation of two fault management concepts, one (BESSIE) where the EPV is functionally integrated with an advanced Caution and Warning (CAW) System, and another less advanced concept (ELSI) with no functional connections between the EPV and the CAW System.

- ELSEI Fault Management Display- at the outset of procedure execution:
  - Participates made fault diagnoses by interpreting information from CAW fault messages (upper left section of display) color-coded fault messages and system status display (upper right section of display), and list of faults found in EPV.
  - Fault management display shows the point when participant has diagnosed malfunction and is inviting to work procedures through the EPV.
  - Blue (‘Current Focus’) line is one of many cues to help operator navigate through the steps in the procedure checklist.

- BESSE Fault Management Display- at the outset of Procedure Execution:
  - Advanced Caution and Warning System interfaces include “Root Cause clues” where automated malfunction diagnosis is provided.
  - A simple box highlights system component associated with automated diagnosis.
  - The EPV displays all available fault messages for verification of automated diagnosis of malfunction.
  - Fault management display shows the point in which participant has accepted and selected the automated diagnosis, which has automatically brought up the appropriate checklist in the EPV.
  - Nº of steps required compared to ELSEI due to automated checks for sensor failures.