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THE PATH TO CREW AUTONOMY - SITUATIONAL AWARENESS IN SCHEDULING AND RESCHEDULING TASKS FOR NOVICE SCHEDULERS

Abstract

In order to increase crew autonomy for long duration exploration-class missions (LDEM), certain mission support tasks need to be completed by crew. Currently, crew activities are scheduled over the course of several weeks by ground-based experts with years of experience-based training. These experts display extensive amounts of situational awareness (SA) throughout task execution by maintaining a mental model of additional factors during scheduling such as constraints (e.g. physical space/layout), abilities and skills of the crew, and crew preferences allowing them to anticipate and mitigate potential issues. Thus, situational awareness is a key component for crew to manage their own schedules.

In this paper, we examine the relationship between situational awareness and performance in novice schedulers in both a scheduling and rescheduling task. This work is vital to ensure the successful transfer of mission support tasks to the crew for future LDEM.

A ground-based investigation was conducted utilizing Playbook, a web-based scheduling platform. Subjects were randomly assigned to either a 'schedule' (n=15) or 'reschedule' (n=16) group. Each subject performed 9 experimental trials and situational awareness was evaluated using a modified version of the Situation Present Assessment Method (SPAM). This modified SPAM was administered at the conclusion of each trial to prevent any interruptions during the scheduling/rescheduling task itself. Performance metrics (time on task, violations created, tasks left unscheduled, workload, etc.) were also measured.

From data collected in February 2021, we will report on SA and performance in a rescheduling task for novice schedulers and compare our results to those found for a scheduling task. Limited data exists for novice schedulers; however, previous work indicates that there is a relationship between situational awareness and performance for scheduling. This relationship has not yet been explored for rescheduling tasks. Thus, quantifying the relationship between SA and performance for scheduling and rescheduling tasks for novice schedulers will move future research forward on the path to crew autonomy.