

## SOFTWARE SYSTEM FOR REAL-TIME MEDICAL OPERATIONAL SUPPORT ON ISS

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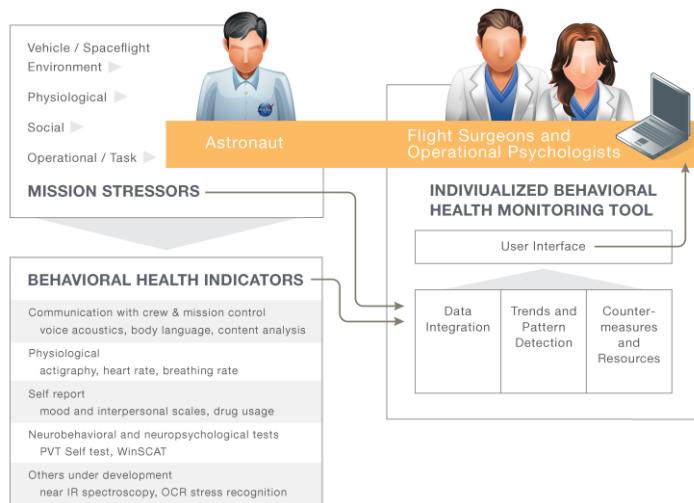
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### INTRODUCTION

Behavioral health and performance risks associated with training for missions, living and working in space, and returning to Earth can be mitigated by accurately monitoring the behavioral health of individual crew members throughout the mission.

### PROJECT DESCRIPTION

The Behavioral Health and Performance Dashboard Software (BHP-DS) provides a suite of behavioral health indicators placed within the context of the mission's behavioral health stressors (Figure 1). These indicators are unobtrusively collected and integrated from multiple sources. Statistical data analysis algorithms suitable for small data samples collected in operational environments (i.e., sparse, noisy and irregular data) capture changes or trends in behavioral health indicators that may occur over time during the mission or relative to a specific acute stressor. When viewed by astronauts, operational psychology personnel, and flight surgeons, the dashboard provides operationally meaningful behavioral health feedback.



**Figure 1:** Data flow map for the Behavioral Health and Performance Dashboard Software. Information about mission stressors, behavioral health indicators, interpersonal interactions, and countermeasures is collected, processed, and presented to flight surgeon and operational psychologist users.

### WORK ACCOMPLISHED

We are enhancing the prototype version of the BHP-DS by:

- Expanding existing features to include medical information uniquely relevant to NASA flight surgeons.
- Designing a module to allow operational psychologists and flight surgeons to conduct comparative analysis of multiple sleep and fatigue countermeasure scenarios with respect to predicted effects on fatigue.
- Integrating with the NASA Mission Medical Repository (MMR) to provide users of the BHP-DS with timely mission medical data from sensors on-board the ISS (e.g. CO<sub>2</sub> concentration levels).

### DISCUSSION

When validated, the Dashboard can be deployed during space missions to track behavioral health indicators and mission stressors. This will allow behavioral issues to be detected and mitigated at an early stage.

### REFERENCES

- [1] Slack et al. (2008), NASA Human Research Evidence Book BHP Evidence Report on: Risk of Behavioral and Psychiatric Conditions.

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