Fiscal Year:	FY 2008	**Task Last Updated:**	FY 06/02/2008
PI Name:	Dinges, David F. Ph.D.		
Project Title:	Optical Computer Recognition of Stress, Affect and Fatigue during Performance in Spaceflight		
Division Name:	Human Research		
Program/Discipline:	NSBRI		
Program/Discipline--Element/Subdiscipline:	NSBRI--Neurobehavioral and Psychosocial Factors Team		
Joint Agency Name:		**TechPort:**	Yes
Human Research Program Elements:	(1) **BHP**:Behavioral Health & Performance (archival in 2017)		
Human Research Program Risks:	(1) **BMed**:Risk of Adverse Cognitive or Behavioral Conditions and Psychiatric Disorders		
Space Biology Element:	None		
Space Biology Cross-Element Discipline:	None		
Space Biology Special Category:	None		
PI Email:	dinges@pennmedicine.upenn.edu	**Fax:**	FY
PI Organization Type:	UNIVERSITY	**Phone:**	215-898-9949
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City:	Philadelphia	**State:**	PA
Zip Code:	19104-4209	**Congressional District:**	2
Comments:			
Project Type:	GROUND	**Solicitation / Funding Source:**	2007 Crew Health NNJ07ZSA002N
Start Date:	05/01/2008	**End Date:**	04/30/2012
No. of Post Docs:		**No. of PhD Degrees:**	
No. of PhD Candidates:		**No. of Master' Degrees:**	
No. of Master's Candidates:		**No. of Bachelor's Degrees:**	
No. of Bachelor's Candidates:		**Monitoring Center:**	NSBRI
Contact Monitor:		**Contact Phone:**	
Contact Email:			
Flight Program:			
Flight Assignment:			
Key Personnel Changes/Previous PI:			
COI Name (Institution):	Banks, Siobhan (University of Pennsylvania School of Medicine) Metaxas, Dimitri (Rutgers University)		
Grant/Contract No.:	NCC 9-58-NBPF01601		
Performance Goal No.:			
Performance Goal Text:			

Task Description:	Astronauts must maintain high-level performance while experiencing demanding workload and work schedules, extreme environmental risks, and psychosocial stressors in space (for example, isolation and confinement). Stress, negative emotion and fatigue can jeopardize their cognitive performance and neurobehavioral status. The project will deliver an objective, unobtrusive, computational model-based tracker of the human face that validly and reliably identifies when astronauts are experiencing stress, emotion and fatigue at levels that compromise performance in space. This optical computer recognition (OCR) system will provide feedback to them for autonomous selection of countermeasures for stress, depression and fatigue. The project will be accomplished through collaborative efforts of Dr. David Dinges (Unit for Experimental Psychiatry) at the University of Pennsylvania School of Medicine, and Dr. Dimitris Metaxas (Computational Biomedicine Imaging and Modeling Center) at Rutgers University. Specific Aims 1) Create an OCR system capable of monitoring facial displays of specific emotions (i.e., angry, happy and sad). 2) Improve our current OCR systems ability to detect facial expressions of high-performance versus low-performance-induced stress. 3) Develop OCR algorithms to identify fatigue due to sleep loss based on slow eyelid closures. 4) Test the technical feasibility of data acquisition and reliability of the advanced OCR system in spaceflight analogs, such as NEEMO, that contain neurobehavioral stressors relevant to spaceflight. The project has primary relevance to strategic goals of the NSBRI Neurobehavioral and Psychosocial Factors (NBPF) Team. It addresses a high-priority gap identified by the NASA Small Assessment Team, Behavioral Health and Performance, and NSBRI NBPF Team areas. and the project specifically targets questions 25d, c, f, and h of Bioastronautics Roadmap Risk Area 25 (Human Performance Failure Due to Neurobehavioral Problems), and question 27d in Risk Area 27 (Human Performance Failure Due to Sleep Loss and Circadian Rhythm Problems).
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	
Task Progress:	New project for FY2008.
Bibliography Type:	Description: (Last Updated: 04/24/2024)