REPPERGER RESEARCH INTERN PROGRAM

RESEARCH PROJECT #: AFRL-RHB-26-01

Neurotechnologies for Cognitive Enhancement

PROJECT DESCRIPTION: Preserving the US Military's competitive advantage in a time of great-power competition requires strategic, operational, and tactical readiness. Through innovative research and development, we aim to achieve technological superiority in critical systems, like the human, to support warfighter readiness. A present challenge for human warfighter readiness is that warfare tactics have increasingly moved from procedural routine-based tasks to more cognitively demanding and complex tasks that require constant vigilance, reasoning, and decision-making. Therefore, there is a need to deploy powerful technology for the warfighter during these long-duration and cognitively demanding missions to achieve military readiness. Using non-invasive neurostimulation technologies to enhance cognitive performance has been found to be better tolerated, have fewer side effects, and have more long-lasting effects than common pharmaceutical interventions. However, these technologies are new and there is little research into applications and best practices for use in military environments. Also, these technologies tend to be more well established for clinical applications and do not always utilize a form factor conducive to use in healthy individuals. Therefore, this effort will explore further applications of these technologies for military use as well as design/application considerations for transition to operational use.

LEARNING OBJECTIVES: The student intern will learn how to collect human subjects research data including physiological, neurophysiological, and behavioral data. The student will also learn how to apply innovative design techniques to aid in the development of neurotechnologies for warfighter use. The student will attend and participate in weekly lab meetings, tours, and play an active role in designing, conducting, and analyzing experiments. The student will assist in sharing research findings through report writing and presentations.

ACADEMIC LEVEL: Undergraduate; Masters; Doctoral

DISCIPLINES NEEDED: Mechanical Engineering, Biomedical Engineering, Experimental Psychology

RESEARCH LOCATION: Wright-Patterson Air Force Base, Dayton, Ohio

RESEARCH MENTOR: Lindsey McIntire, M.S.
Psychology, Wright State University, 2012

Lindsey McIntire is a research psychologist for AFRL. She is currently pursuing her PhD in Human Factors Psychology at Wright State University. Her research focuses on using neurotechnologies to augment cognition mainly in the areas of attention, arousal, learning, and fatigue.

The material was CLEARED on 09 Nov 2023; Case Number: AFRL-2023-5724.