

1. Research Title: Identifying neural markers of impediments to optimal decision making
2. Individual Sponsor:
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3. Academic Area/Field and Education Levels: cognitive science, cognitive psychology, neuroscience, biomedical engineering, neuroscience, computer science; MS, PHD
4. Objectives: The Neural Interfaces Laboratory is working to provide a decision advantage to Airmen and Guardians via personalized support for decision making (e.g., decision support systems, cognitive augmentation). The objective of the current research is to leverage neuro-cognitive attributes to quantify and monitor decision making states, attributes, and progress to anticipate the need for decision support or augmentation. This effort seeks to identify potential neural signatures of cognitive states that impede fast, effective decision making.
5. Description: The researcher will leverage neuroimaging techniques (e.g., EEG, fNIRS, fMRI) to characterize the neural and/or physiological markers associated with human cognitive states (e.g., indecision, confusion) or attributes (e.g., bias, low confidence) that impede optimal decision making and harm cognitive task performance. The researcher is expected to leverage neural features and any relevant cognitive attributes to develop a computational or statistical model that accurately classifies the cognitive states, based on neural markers, of out-of-sample data (either within or between participants). Additionally, the research will explore the relationship between decision states and cognitive performance outcomes to understand how decision-making processes impact overall cognitive function and contribute to the fostering of resilience in order to maintain decision superiority.
6. Research Classification/Restrictions: Unclassified, no restriction
7. Eligible Research Institutions: Universities in OH (DAGSI eligible)

PA Approval #: Case Number: AFRL-2024-5221