



Computational Intelligence and Neuroscience

Special Issue on
**Cognitive State Assessment: Advances in
Neuroergonomics**

CALL FOR PAPERS

An increasing number of projects aim to assess the cognitive state of a human user or operator. For example, cognitive state assessment is beneficial for driving adaptive automation interfaces and for determining whether or not a pilot or driver is experiencing high workload or is fatigued or inattentive. Within a typical paradigm, machine-learning methods are used to build a model to distinguish between two or more cognitive states of interest, using data derived from human behavior or physiology or both. While variations of such paradigms have reported increasing success in inferring cognitive state with metrics such as EEG, ECG, and eye tracking, several theoretical and practical issues remain. Importantly, several of these issues are not faced within the larger field of machine learning more generally and may require unique solutions from experimentalists and practitioners working specifically within the domain of cognitive state assessment.

Ongoing challenges include developing methods to reduce conceptual circularity that may occur when the subjective report of the operator is used as labels to train a machine learning model, when such a model is intended to uncover a latent cognitive state. Additional challenges include the utilization of data collection techniques or technologies that aim to be less invasive on the user and developing techniques to improve the interpretability of machine learning models, to allow for classification paradigms to more usefully inform cognitive theory. Paradigms that improve the generality of learned models, such that state assessment is maintained across participants or across experimental sessions, are also highly sought after. In this special issue we encourage papers, investigations, algorithms, and classification techniques aimed at addressing any of these key issues.

Potential topics include, but are not limited to:

- ▶ Approaches to establish ground truth
- ▶ Generalizable classifiers
- ▶ Methods capitalizing on low cost wearable sensors
- ▶ Increasing the interpretability of models
- ▶ Machine learning techniques that improve over time
- ▶ Classifiers that interact with automated systems
- ▶ Methods of addressing limited data sets or poor signal quality

Authors can submit their manuscripts via the Manuscript Tracking System at <http://mts.hindawi.com/submit/journals/cin/csaa/>.

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