



Selection of Psychophysiological Features Across Subjects for Classifying Workload Using Artificial Neural Networks

By Trevor I. Laine

Biblioscholar Nov 2012, 2012. Taschenbuch. Book Condition: Neu. 246x189x10 mm. This item is printed on demand - Print on Demand Neuware - The issue of pilot workload is important to the United States Air Force because pilot overload or task saturation leads to decreases in mission effectiveness. Additionally, in the most extreme cases, pilot overload may lead to the loss of aircraft and crewmember lives. Current research efforts are utilizing psychophysiological data including electroencephalography (EEG), cardiac, eye-blink, and respiration measures in attempt to identify workload levels. The primary focus of this effort is to determine if a single parsimonious set of psychophysiological features exists for accurately classifying workload levels between multiple test subjects. To accomplish this objective, the signal-to-noise (SNR) saliency measure is used to determine the usefulness of psychophysiological features in feedforward artificial neural networks (ANNs). The SNR saliency measure determines the saliency, or relative value, of a feature by comparing it to a feature of injected noise. For this effort, 36 psychophysiological features were derived from the data collected as each subject completed simulated crewmember tasks using the Multi-Attribute Task Battery developed by NASA. These tasks were randomly presented to the subjects in blocks with three distinct levels:...



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