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## STRUCTURED AR MULTI-PROCESSES FOR DETECTING COGNITIVE FATIGUE FROM MULTIPLE BRAIN SIGNALS

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Mental fatigue is one of the main causes of human performance failures, leading to accidents in vehicle operation, air traffic control and space missions. Therefore, automatic detection of early signs of mental fatigue is key for increasing safety and human performance in many scenarios.

Electroencephalograms (EEGs) are considered the most informative signals for monitoring mental fatigue among several other physiological and behavioral measures available. We analyze multiple EEG signals recorded in subjects who performed continuous mental arithmetic for a long period of time, which led to severe cognitive fatigue. In particular, we analyze the signals using a multi-process approach in which each of the processes is an autoregression. We impose structured prior distributions that take into account the latent components underlying each autoregressive process. These priors allow us to incorporate relevant information about the components that may characterize various mental states of alertness. We discuss issues related to on-line filtering and automatic detection of fatigue from multi-channel data.