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The Enhancement of Training of Military Pilots Using Psychophysiological Methods

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Abstract : Optimal human performance is a key goal in the professional setting of military pilots, which is a highly challenging atmosphere. The aviation environment requires substantial cognitive effort and is rich in potential stressors. Therefore, it is important to analyze variables such as mental workload to ensure safe conditions. Pilot mental workload could be measured using several tools, but most of them are very subjective. This paper details research conducted with military pilots using psychophysiological methods such as electroencephalography (EEG) and heart rate (HR) monitoring. The data were measured in a simulator as well as under real flight conditions. All of the pilots were exposed to highly demanding flight tasks and showed big individual response differences. On that basis, the individual pattern for each pilot was created counting different EEG features and heart rate variations. Later on, it was possible to distinguish the most difficult flight tasks for each pilot that should be more extensively trained. For training purposes, an application was developed for the instructors to decide which of the specific tasks to focus on during follow-up training. This complex system can help instructors detect the mentally demanding parts of the flight and enhance the training of military pilots to achieve optimal performance.

Keywords : cognitive effort, human performance, military pilots, psychophysiological methods
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