

Toward an on-line and non-obtrusive workload assessment method

Marianne PICHON^{1,2,3}, Patrick MILLOT^{1,2,3}, Simon ENJALBERT^{1,2,3}

1 Univ Lille Nord de France, F-59000 Lille, France

2 UVHC, LAMIH, F-59313 Valenciennes, France

3 CNRS, FRE 3304, F-59313 Valenciennes, France

marianne.pichon@gmail.com, patrick.millot@univ-valenciennes.fr, simon.enjalbert@univ-valenciennes.fr

Abstract: Workload is an index introduced in the 70th for ergonomic purposes, for evaluating the adequacy of tasks to the human operator abilities. Methods based on a self evaluation such as SWAT and TLX gave the best results, but mainly for assessing a total workload after the task has been performed. But in highly dynamical systems as transportation, the driver (or pilot) abilities can be enhanced by driving assistance tools on-line. Therefore new challenges appear which needs new methods for assessing Workload on-line, in real time and without disturbing the human operator. At LAMIH, an online assessment method has been developed and partially validated by Millot in the past. This method is based on one hand, on two workload generators: temporal demands (time pressure) and functional demands (task difficulties). On the other hand, to cope with a possibility of assessment on-line, the workload is defined through the analogy with the physical notions of "power" and "energy". The instantaneous workload $Wl(t)$ is seen as the "power" the human operator invests on-line in the task in order to cope with the task demands. After a time available denoted TA, the human operator has spent a quantity of "energy" WL defined as the sum of the successive instantaneous $Wl(t)$ along TA. These ideas have been validated in multitask situations for discrete as well as continuous tasks like driving tasks, but especially with temporal demands. This paper first compares several methods with the LAMIH's method. It then proposes an extension of this LAMIH's method in order to cope with the new dynamical constraints. Finally it proposes experimental protocols for validating the new LAMIH's method by comparing it with SWAT and TLX methods.

Keywords: Workload assessment methods, multi-task context, sampling period, temporal load, functional load
