Pupillometry measures of cognitive load in meta-T dynamic task environment

Chris Joanis
Rensselaer Polytechnic Institute, Troy, New York, United States

Evan Pierce
Rensselaer Polytechnic Institute, Troy, New York, United States

Wayne Gray
Rensselaer Polytechnic Institute, Troy, New York, United States

Abstract

Pupillometry uses pupil diameter as a physiological measure of cognitive effort and load. In static tasks, pupillometry has revealed that cognitive effort varies with expertise, and, combined with gaze analysis, shows that experts can exert effort to focus on non-salient visual input. Much real-life expertise is practiced in dynamic tasks, and expert effort in dynamic tasks remains unstudied. Using tetris as a dynamic task environment, we collected pupil and gameplay data from individuals of varying expertise levels. We then use collected data and examine cognitive workload differences across levels of expertise. Consistent with studies of image saliency and gaze, our results indicate that experts and novices engage differently with the task and do not experience the same cognitive workload. Further inspection will likely reveal strategy-level sources of these differences.