Physiological data, fatigue, task performance, and timing

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In this talk, we will discuss the interrelationship of physiological measures, fatigue, task performance, and time perception. Based on experimental data obtained in a Virtual Reality setting, we derive influencing factors and effects on timing and fatigue in such experiences correlated to tracked eye movement, body temperature, and heart rate. Fatigue is correlated with task performance and time perception; however, certain physiologicalmeasures are associated with specific variables. Skin temperature, pupil dilation mean, and eye movement variation all correlate with fatigue. Pupil dilation and skin temperature variation, but not their mean value, are associated with the feeling of time passage. In terms of time estimation distortions, the mean of physiological measures correlates, but not their variation. Overall, our results imply that time estimation and feeling of time passage may be represented differently by the same physiological outputs.

Computational modelling of time perception predictors and modulators

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Large body of research in cognitive science has revealed how stimuli in multiple modalities may distort time perception in well-controlled experiments. We focus on environmental stimuli (in particular visual stimuli) and cognitive load. We develop a set of computational models that characterise cognitive load in terms of uncertainty such as incomplete information or unpredictable events. For environmental stimuli, our models focus on saliency, oddball, and speed. We present computational models capable of i) predicting the effect of particular stimuli, and ii) deciding which stimuli should be injected. Our work may impact a future Chronopilot device capable of actively predicting and modulating one's time perception.