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End-to-End Models for the Analysis of System 1 and System 2 Interactions based on Eye-Tracking Data

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Abstract

The Stroop test evaluates the ability to inhibit cognitive interference. This interference occurs when the processing of one stimulus characteristic affects the simultaneous processing of another attribute of the same stimulus. Eye movements are an indicator of the individual attention load required for inhibiting cognitive interference. We used an eye tracker to collect eye movements data from more than 60 subjects each performing four different but similar tasks (some with cognitive interference and some without). After the extraction of features related to fixations, saccades and gaze trajectory, we trained different Machine Learning models to recognize tasks performed in the different conditions (i.e. with interference, without interference). The models achieved good classification performances when distinguishing between similar tasks performed with or without cognitive interference. This suggests the presence of characterizing patterns common among subjects, despite of the individual variability of visual behavior. The results open up interesting investigations.