

Cognitive Ability Estimation and Reinforcement with Eye-tracking Games for Children with Multiple Disabilities

Didier SCHWAB

¹ Univ. Grenoble Alpes, CNRS, Inria, Grenoble INP*, LIG, 38000 Grenoble, France
didier.schwab@univ-grenoble-alpes.fr

Children with multiple disabilities are often unable or at least have great difficulty speaking or making gestures when writing or typing on a touch screen. Most tests to assess their cognitive abilities are completely irrelevant because it is often impossible to distinguish if an absence of response is due to the misunderstanding of the question, to the impossibility of finding an answer or to the mechanical impossibility of giving an answer. In this demonstration, we present GazePlay (gazeplay.net), a free and open-source software that gathers several mini-games playable with most eye-tracking devices. This project is led by informatics academics, and associates parents of children with multiple disabilities, open-source community developers, students and professionals working in specialized centers welcoming this public on a daily basis. These games are designed with a playful objective in mind for the children, but also with the objective of evaluating and working on some of his skills, particularly cognitive ones. The analysis of the child's gaze and its interactions with objects on the screen can thus help therapists to control possible eye problems and evaluate the children's understanding. There are more than 20 games. They aim to improve action-reaction skills (throwing cream pie, bursting bubbles...), selection (scratch cards for example) or finally memorization that can be worked for example to learn to communicate through pictograms. For each of these games, an assessment of the skill at a given time T can be deduced from the analysis of the eye traces at the end of a game, or analyzed in the longer term to follow the child's evolution.

*. Institute of Engineering Univ. Grenoble Alpes