

EyeDee and EyeBrain Solutions for Disease Detection

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Abstract — In order to understand the impact of human's vision during daily activities it is common practice to use eye tracking solutions, which are implemented as human-machine interaction (HMI) devices that collect and exchange data with some processing units. The EyeDee embedded eye tracking solution developed by SuriCog is world first solution using the eye as a real-time, mobile digital cursor for industry-grade applications (interaction with objects in known environment). EyeDee is primarily dedicated to be used in multimedia applications (integration with objects placed in known environment), decision critical applications (control centers), ergonomic assessment and training applications (e.g., cockpit of an aircraft or a helicopter). EyeBrain T2 tracker (part of SuriCog's portfolio) is CE marked medical device that provides assistance in the diagnosis of neurological and psychiatric diseases. Capturing eye images at very high framerates permits to use EyeBrain in clinical research, and the analysis of rapid eye movements (saccades) provides a reliable basis for early, objective and accurate markers of neurological diseases such as Parkinson's disease (PD), Alzheimer's disease (AD), Huntington's disease (HD) spino-cerebellar ataxia (SCA) or multiple sclerosis (MS). The EyeBrain system provides standardized oculomotor tests which are analyzed automatically. We propose to introduce the EyeDee and EyeBrain systems and show their potential for multi-disease detection. In order to reach low-power, low-heat, low-MIPS requirements, a product is designed as an extra-small, wearable form IoT-device, which is remotely controlled for data transfer with a processing unit capable of performing further data analysis.

Keywords: *eye tracking, human-machine interaction, eye movement disorders, neurological diseases*