Demo: http://eyewear.pro

An Open Platform to Record and Analyze Large Scale Data Sets from Smart Eyewear

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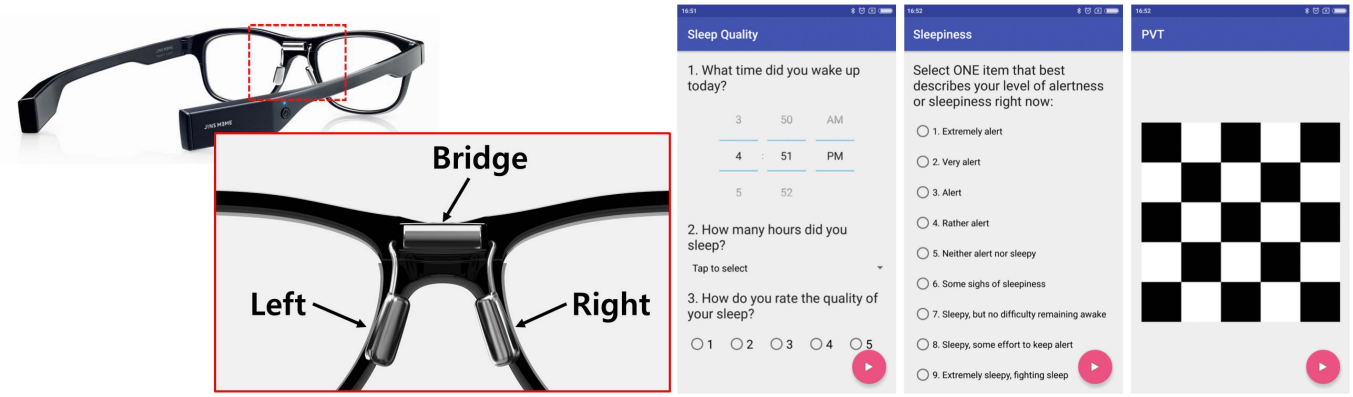

Figure 1: J!NS MEME Smart Glasses able to record eye and head movements using Eletrooculography and motion sensors (on the left). Opensource recording smart phone application with sample questionnaires, tests (on the right).

ABSTRACT

In this demo, we present the smart eyewear toolchain consisting of smart glasses prototypes and a software platform for cognitive and social interaction assessments in the wild, with several application cases and a demonstration of activity recognition in real-time. The platform is designed to work with Jins MEME, smart EOG enabled glasses, The user software is capable data logging, posture tracking and recognition of several activities, such as talking, reading and blinking. During the demonstration we will walk through several applications and studies that the platform has been used for.

KEYWORDS

eyewear computing, recording

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1 INTRODUCTION

In this work we present the software and hardware platform for cognitive and social interaction assessments in the wild, with several application cases and a demonstration of activity recognition in real-time. The platform is built around J!NS MEME (see Fig.1), smart eyewear capable of recording EOG and head movement. Lightweight design, modern appearance and long battery life make this device perfect for long term EOG recordings in everyday situations outside of controlled lab environments. These kinds of unobtrusive devices can be the next step in personal fitness tracking and could

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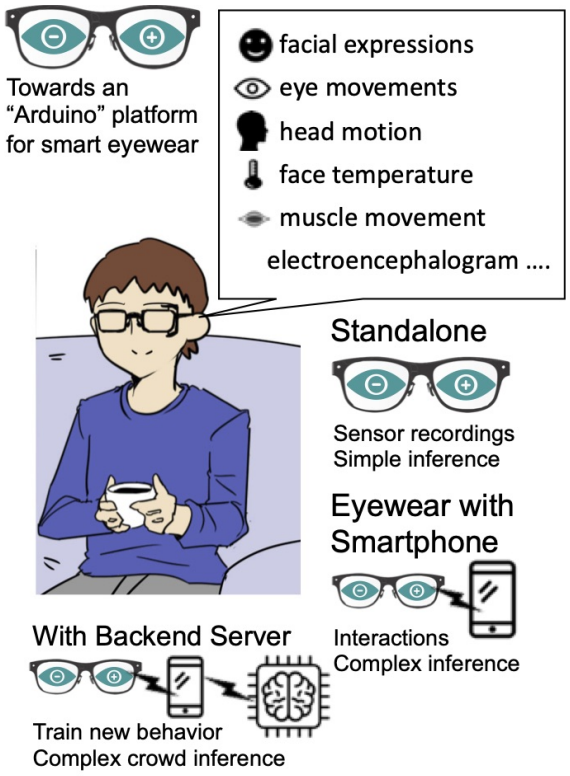

Figure 2: The concept image of the eyewear platform.

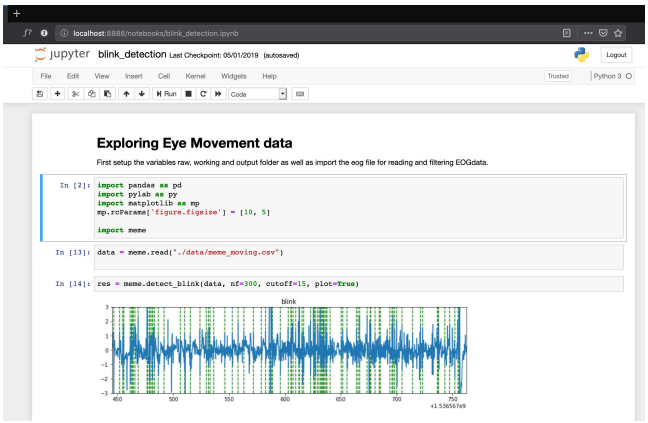

Figure 3: An iPython analysis environment for the eyewear data).

enable large scale research of mental, cognitive, and social dynamics. Especially, the use of EOG and placement of the IMU inside the glasses temples opens up many interesting perspectives for research.

The platform has been demonstrated in part and used for a couple of presentations (see also Figure 2 for a concept image). We also submitted a mobileHCI demonstration. Overall, we introduce a couple of hardware and software tools used by us in several research works [1–5]. We also present an anlysis recorded with this toolset at ISWC as full paper.

2 DEMONSTRATIONS

The presented setup consists of applications running on Android, MacOS and Windows platforms with a cross-platform recording server and real time demos for activity recognition, potentially enabling long-term in-the-wild studies, too. In its present form the platform uses Jins MEME, but is flexible enough to be adjusted for any other similar device. Since MEME is not capable of running user applications it requires a Bluetooth Low Energy (BLE) enabled device for data recording and analysis. We also present some tools for data analysis of recorded EOG and motion data (see Figure 3).

The presented setup consists of data gathering tools and activity recognition systems developed over the years and used by our lab. We are proud to present and share with the community our tools, hoping to enable and inspire more research in this area. Presented tools allow large scale data recordings, real time activity recognition and demonstrate how smart eyewear can be used for input and implicit interactions.

3 ACKNOWLEDGEMENTS

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