

A child-friendly wearable device for quantifying environmental risk factors for myopia

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ABSTRACT

S 1 Supplementary Materials

S 1.1 Hardware

Table 1 provides the complete list of the off-the-shelf parts needed to build the device. The prices are approximate and were obtained at the time the manuscript was submitted. Some upgrades are of course possible. Moving from Raspberry Pi version 3b to version 4b or 5 would require re-compiling the Intel® RealSense™ SDK. Upgrading from the Intel® RealSense™ D435i to the newer D465 or to another RGB-D camera, like the Stereolab ZED Mini, would require modifying the design of the sensors carrier.

Head-Mounted device	
Intel Realsense D435i	\$334
Adafruit AS7262 6-channels spectral sensor	\$20
Bike helmet (size S)	\$30
Computer pack	
Raspberry Pi 3b+	\$35
128GB SD card	\$15
GeekWorm UPS Hat X728	\$60
2x 18650 Lithium batteries, 3.7V, 3500mah	\$20
Spare Parts	
Blots, screws and nuts	~\$1
USB-c braided cable 1.5m	\$5
Plastic for 3D printed parts (≈200g)	\$10
4P4C telephone cable 1.5m	~\$1
TOTAL	~\$530

Table 1. List of parts and prices for building the head-mounted device and computer pack

S 1.2 Software

The Raspberry Pi mounts a customized version of the official Raspberry Pi OS (2020/08/20 raspios buster armhf lite). On it, we installed the following tools:

- Intel® RealSense™ SDK 2.0 (compiled on platform)
- Circuit Python (for connecting to the AS7262)

A complete shipping list with assembly instructions and the OS with the tools installed will be made available at <https://osf.io/43ut5/>