

SMART GLASSES: OcuLab

ROKOS Award – Hope Oloye

On the 4th July, I joined the ‘OcuLab’ team for two weeks. The soon to be startup was currently situated in John Radcliffe hospital and funded by the Nuffield Department of Clinical Neuroscience. OcuLab had designed a pair of ‘Smart Glasses’ with the aim to increase the freedom, independence and quality of life of those registered as blind in the UK, by developing a fairly simple prototype.

Using a pair of old Ski goggles, a LED display and a depth camera from an X Box Kinect™, they’d created a tool which enabled visionally impaired people to make use of their residual vision. The glasses sent out an infrared light pattern and collected information on the pattern and distortion of the light that got sent back. So that the user could determine the distance of objects in relation to themselves.



Newer prototypes, included more cameras and see through displays in order to complement vision untouched by the sight claiming disease. They increased the contrast and edge perception and removed distracting information, so that images closer and of more imminent importance to the user appeared in high resolution, with quality of detail fading away with distance. Resulting in a sensation similar to being in a cartoon drawing. In this way, OcuLab were able to produce a portable device that exploited technology, initially engineered for the entertainment industry.

I joined the group, just after the successful completion of a large trial with the Royal National Institute for Blindness (RNIB). The trial collected information about the effect of the glasses in around 200 people with various eye-related diseases both in lab and at a home trial. My job was to analyze the data recorded from the trial and search for factors, which could be used to predict the likelihood of a participant benefitting from the product. The type of condition, length of time the person has suffered from it and their residual visual acuity were all factors I examined. I also assessed the suitability of the glasses’ different modes for members of the testing group according to the above factors and lastly, I drew estimates on the percentage of the UK population with visual impairments that will benefit from the Smart Glasses.

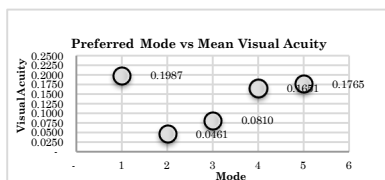


Fig. 20. Mean Visual Acuity for each of the 5 modes preferred

I used various statistical analyses software, including ANOVA and gained a proficiency in Excel over my time at the lab. I then finally collated all of my evidence, into an analytical report and then turned it into a presentation, which I gave to the whole team including the PI! Whilst presenting my figures I was often called upon to back up my data with method explanation, and my own concluding remarks. Giving advice on the next steps of testing and the best market for the product at present, according to my results.

Estimated Total Percentage of Visually Impaired with an Objective Benefit from Smart Glasses	61.29%
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Being a part of the OcuLab team for the summer gave me the opportunity to participate in an interdisciplinary scientific body, working to do what was previously thought impossible without major surgical intervention – allowing the blind to see.