Digitalization of eye charts for visual acuity testing

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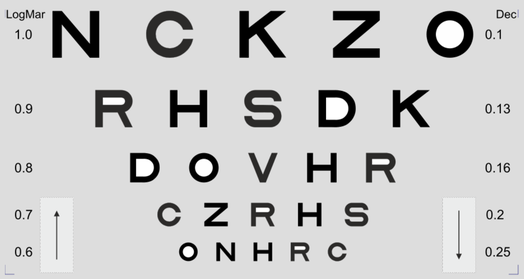
Summary

Digitalization of Visual Acuity Testing is a project involving development of a method for digitalization the displaying of optician's eye charts. Using a Raspberry Pi, an Android tablet device and network communication over WiFI we have created a system for displaying these charts on a screen. The system will be used as a prototype for possible future work.

Visual Acuity

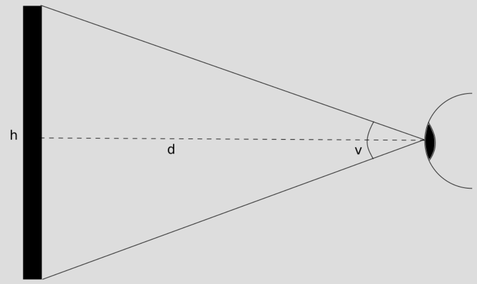
Measurements of visual acuity uses charts with lines of continuously smaller symbols. The measurement is made reading symbols on the chart from a set distance. Reading down the chart until it is no longer possible to make out the characters makes it possible to determine a visual acuity.



Example of an eye chart used as reference for the project

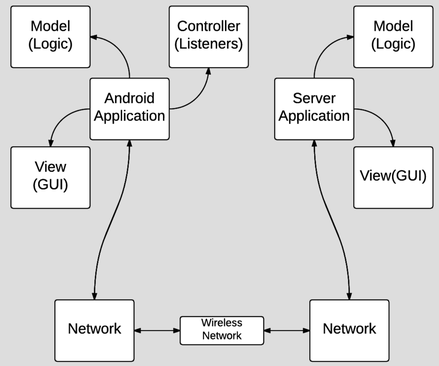
Optotype sizes

The size od each optotype is measured in LogMAR (Logarithmic of the Minimum Angle of Resolution), which is the base 10 logarithm of the angle of one fifth of a letter. The optotypes on the top row of the chart is of the size 1.0 LogMAR and then each row below is decremented by 0.1 LogMAR to the last row which is -0.3 LogMAR.



System structure

The system'smost important part is the Android device where the user controls the server program over a wireless network. The Android application follows a common pattern to be easy to use.



The part of the system responsible for the rendering of the eye charts are built on a Raspberry Pi device. It is small and cheap which was a big requirement when developing the system. Though it is small it is also powerful enough for our purpose.

Usage of system

Acknowledgements

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