

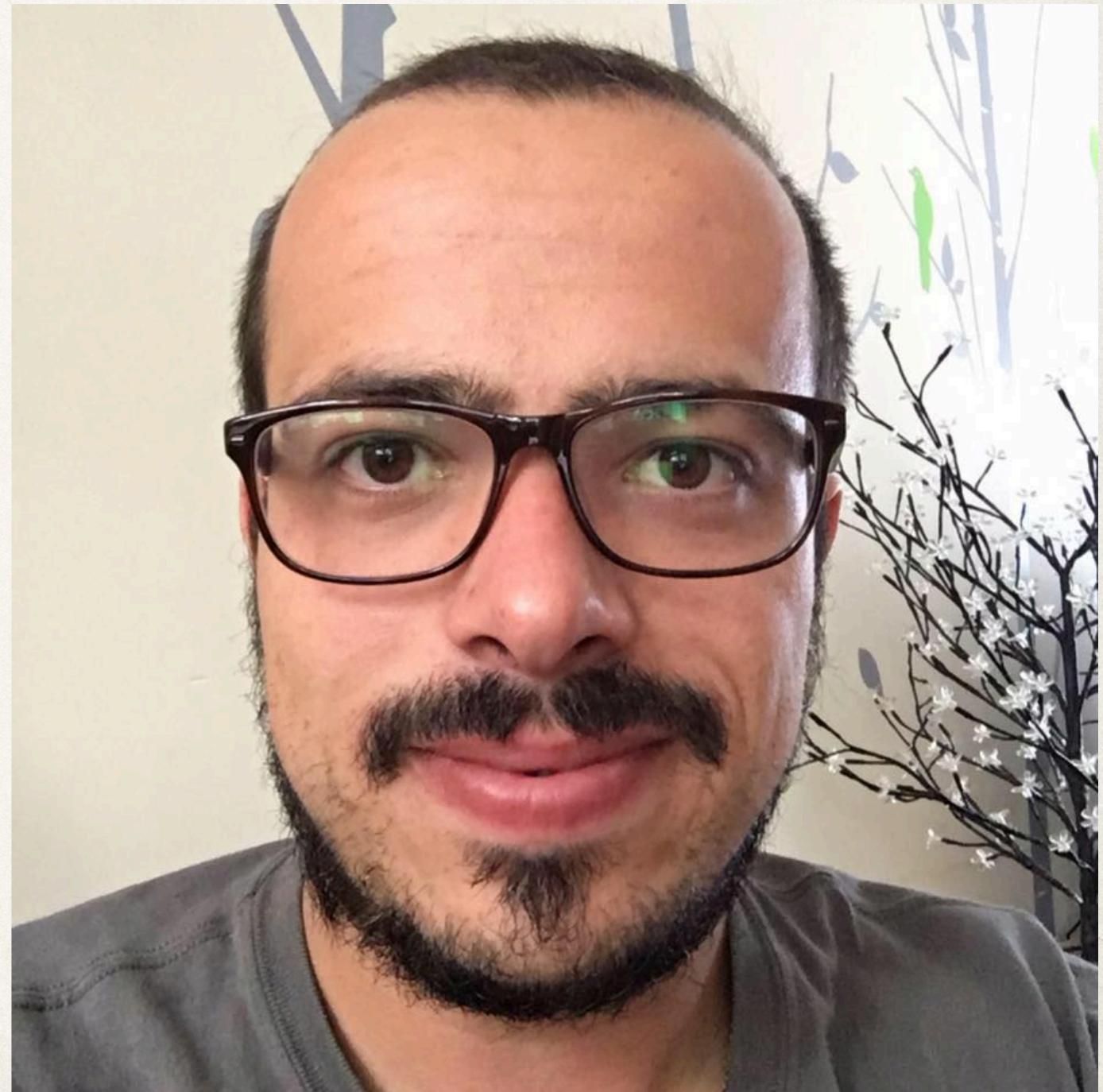
e-Scan

Quick and cheap way to diagnosis vision diseases using Virtual Reality

> Sudo: immerse - Team Hackathon Challenge, Cambridge 18-19 November 2017

Los compañeros: Luiz

- ❖ Brazilian
- ❖ Background: Math, Computer Science and Finance
- ❖ Skills: Code, Football and Music
- ❖ Hobbies: Retro games, raspberrypi & Arduino, Football



Los compañeros: Kamal

- ✿ Nigerian
- ✿ Background: Engineering, Computer Science and Finance
- ✿ Skills: Code, Dance and Cooking
- ✿ Hobbies: Movies, raspberrypi & Arduino, Travel



Agenda

- ❖ Vision Loss in numbers
- ❖ Low Vision & Diseases
- ❖ Low Vision Exams

- ❖ The challenge

- ❖ PeekVision.org

- ❖ e-Scan:
 - ❖ Approach
 - ❖ DEMO
 - ❖ Next Steps...

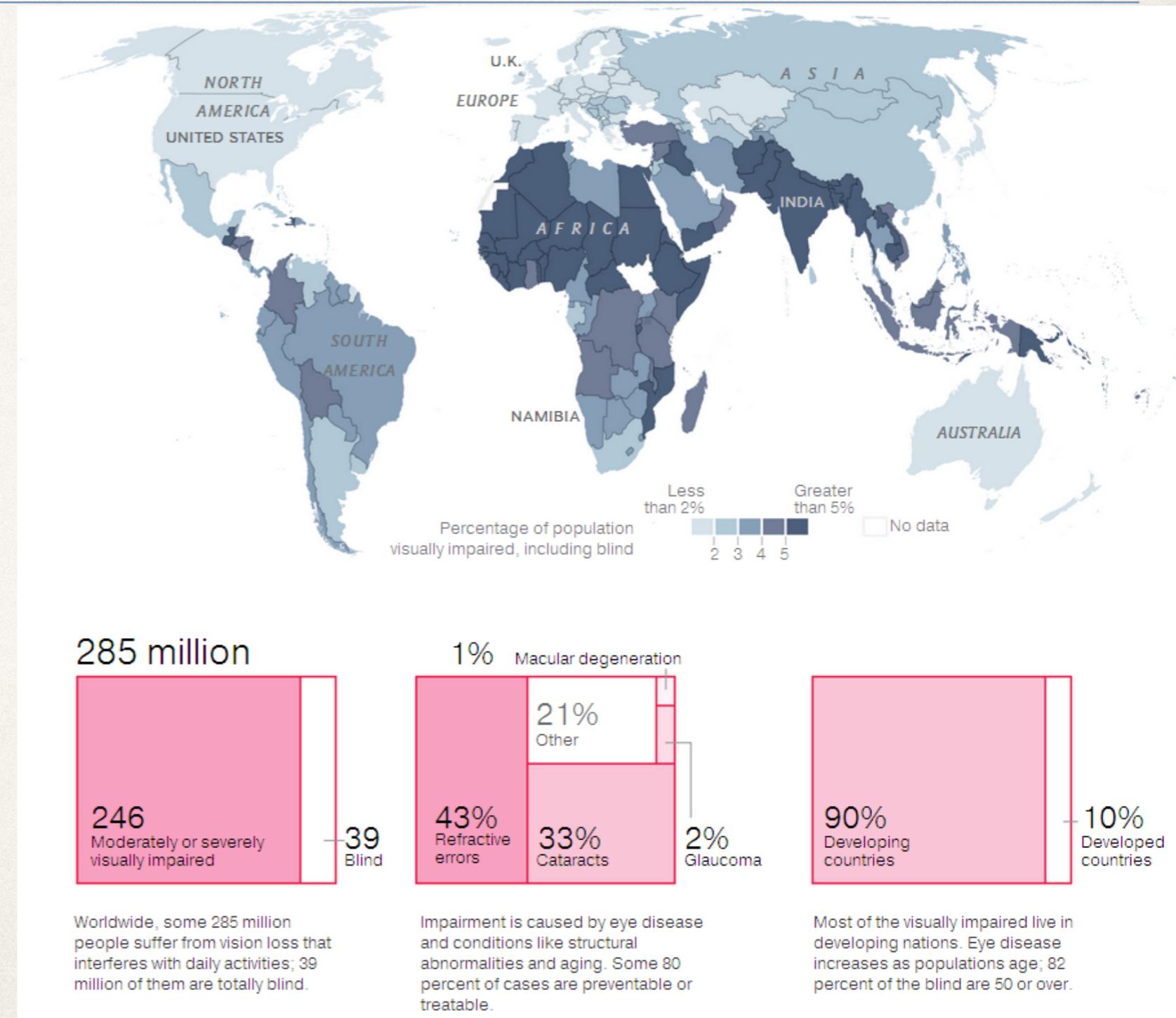
Vision Loss in numbers



World Health Organization

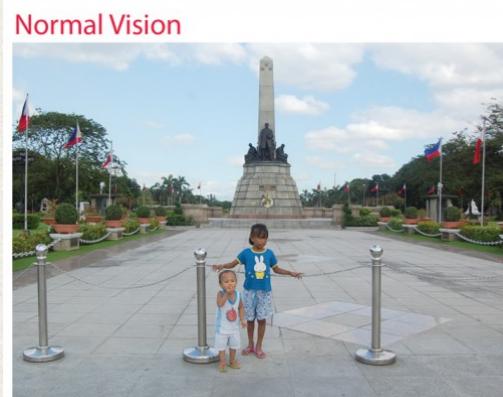
Developing countries

- ❖ Low standard of living
- ❖ Undeveloped Industry
- ❖ Low levels of:
 - ❖ Education
 - ❖ Healthcare
 - ❖ Life expectancy



Low Vision & Diseases

Low Vision as a visual impairment not correctable by standard glasses, contact lenses, medication or surgery that interferes with the ability to perform activities of daily living.



(Photo by CHONA M. DUROGA)



NORMAL VIEW

VIEW WITH
RETINITIS PIGMENTOSA



Low Vision Exams

Help to determine how much side (or peripheral) vision the patients have and how much surrounding area they can see

① www.ophthalworld.de/lshop/showdetail,2004g,en,,optiker,14082015,345,Tshowrub--optiker.htm

The screenshot shows a product page for an 'Automatic Perimeter Zeiss Humphrey Field Analyzer HFA 3 / 830, incl. table, printer, keyboard, mouse, NEW'. The page includes a sidebar with categories like 'New arrivals!', 'Big ophthalmic devices', and 'Opticians'. A large red arrow points from the 'Diagnosis' section below to the price box on the right.

Help Shop-Service Special services Our Services Contact GBC Operating Instruction Deutsch italiano Newsletter My Account Hotline +49 (0)711-91 26 34 70 Shopping cart 0 Items EUR 0,00 Edit / Checkout expand cart

Search the whole shop Your Search Term Prices are including 19% German VAT plus shipping cost

You are currently here: Home | Opticians

Automatic Perimeter Zeiss Humphrey Field Analyzer HFA 3 / 830, incl. table, printer, keyboard, mouse, NEW

EUR 22.614,80 EUR 19.004,03 (net/export price) plus shipping

Quantity: 1 Add to cart Delivery Time: minimum 3 Weeks

SCH@IRER Ophthalm-Technik Vertriebs-GmbH

ophthalworld.de augenarztbedarf.de

Categories

- New arrivals!
- Big ophthalmic devices
- Small ophthalmic devices
- Furnishings
- BIO Lenses & Contact Lenses
- Trial frames & trial lenses
- Panels and racks
- Sight Testing
- Ophthalmic Surgical Instruments and storage
- Illuminant
- Consumables
- Opticians
 - automatic refractometers new and pre-owned
 - automatic refracto-keratometers new and pre-owned
 - Drills
 - Inking

Diagnosis

- ✿ Glaucoma
- ✿ Retinitis Pigmentosa
- ✿ Aged-Related Macular Degeneration

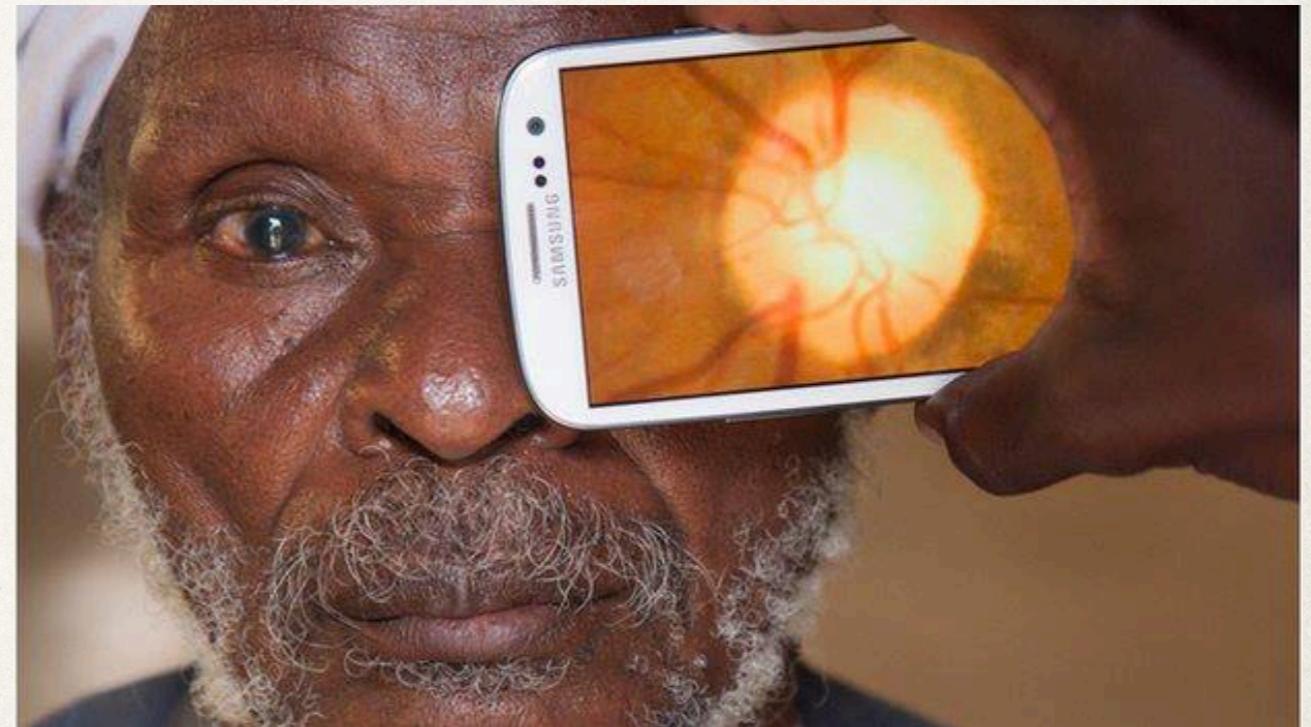
The challenge

How to make Low
Vision Exams **cheap**
and **accessible** for
developing countries?



PeekVision.org

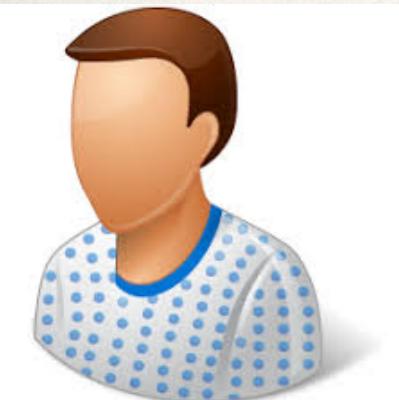
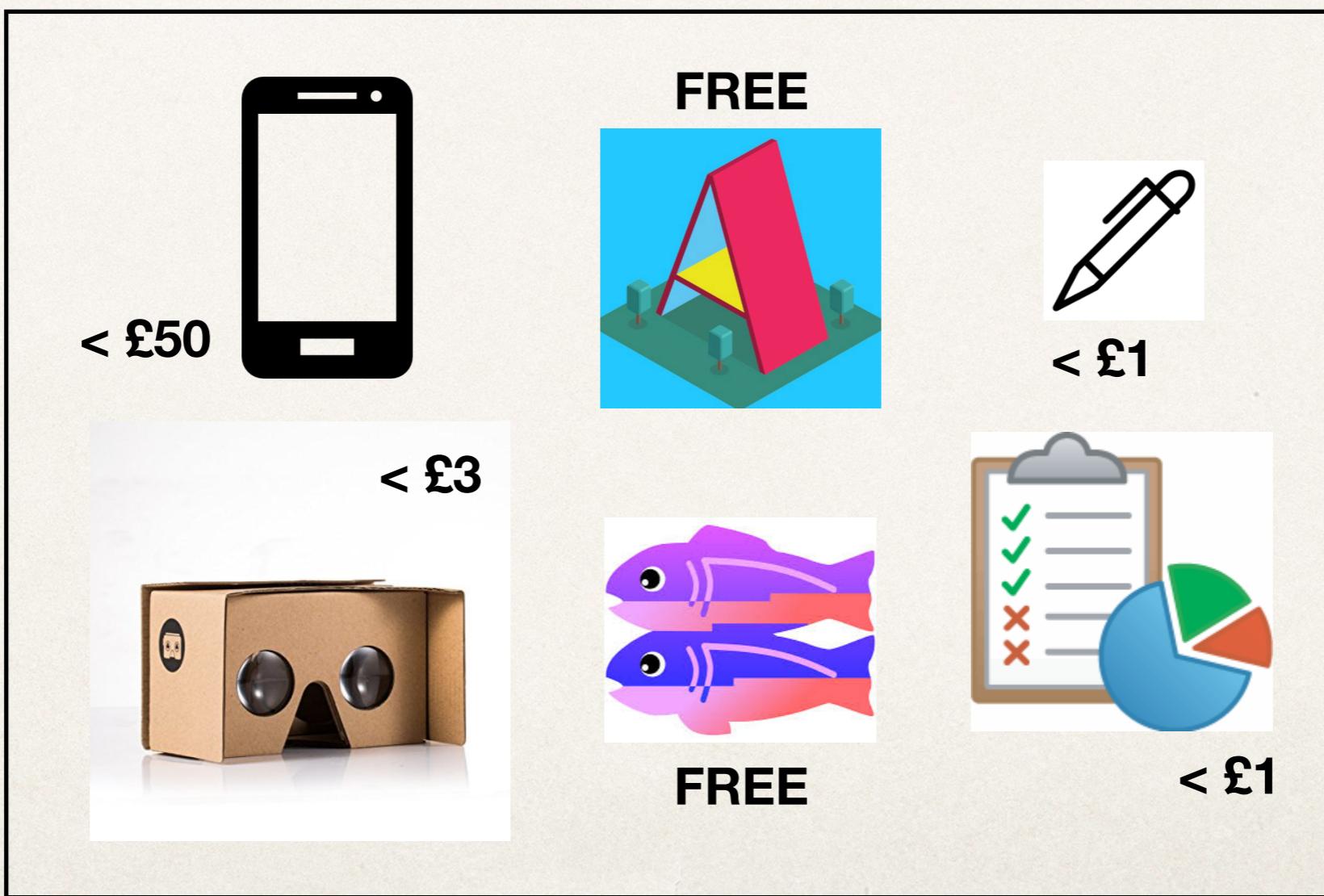
PeekVision.org mission: Create **technology** and health intelligence that empowers healthcare providers to deliver **quality**, sustainable **eye and health care to everyone.**



e-Scan: Approach

Low cost (< £55) tool to identify Vision Diseases

e-Scan



Patient

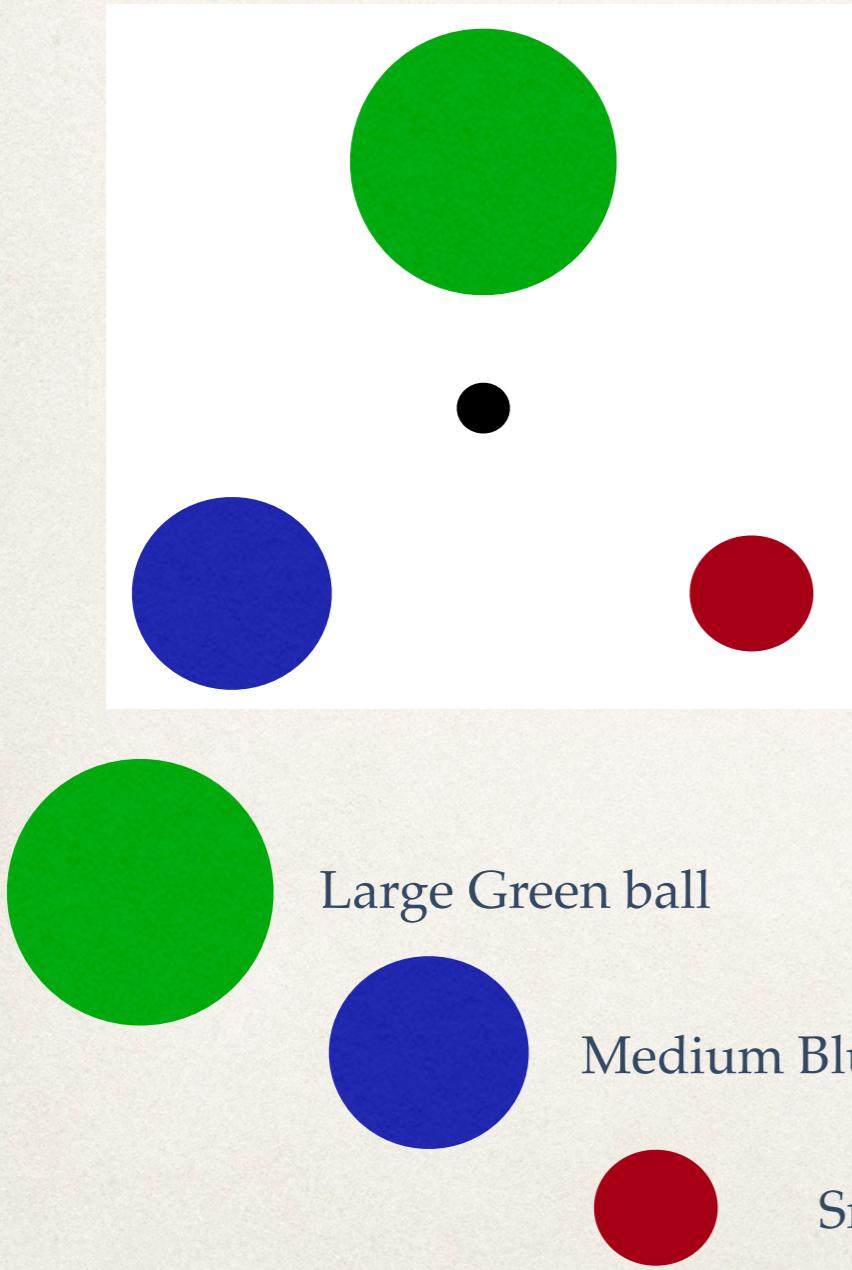


Doctor

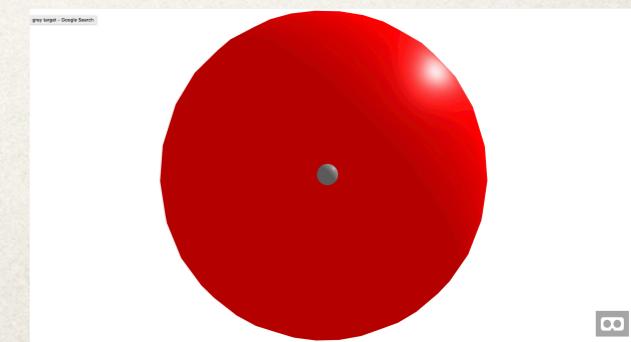
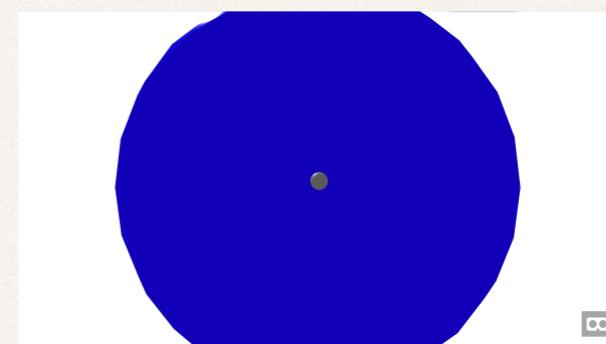
e-Scan: DEMO

e-Scan: Virtual Room

Top View

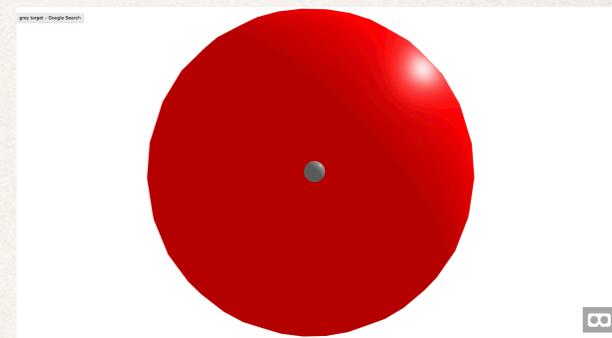
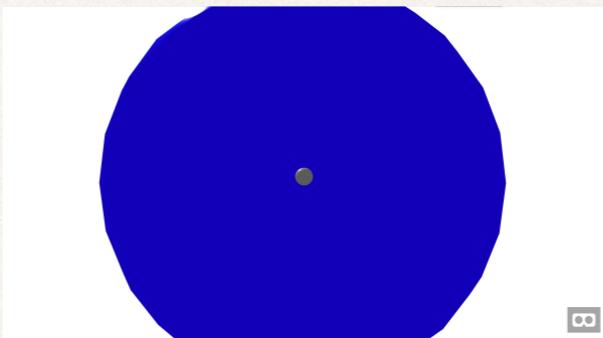
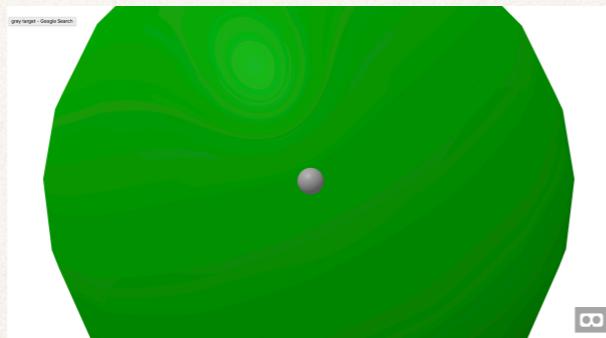


Patient view

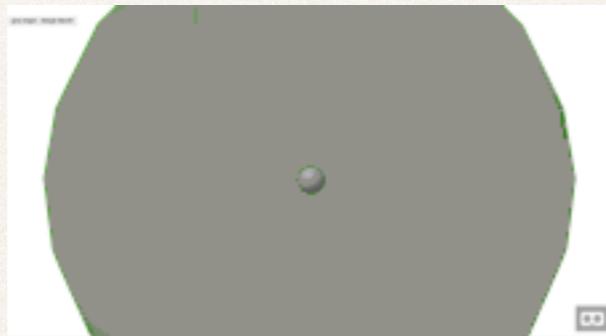


e-Scan: Colour Check

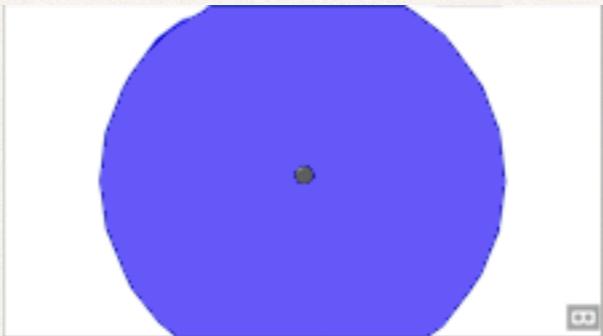
Benchmark:
Normal Vision



Colour issues



Green-blindness
(deutanopia)



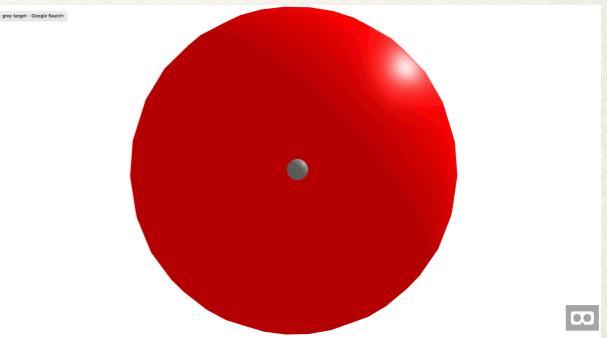
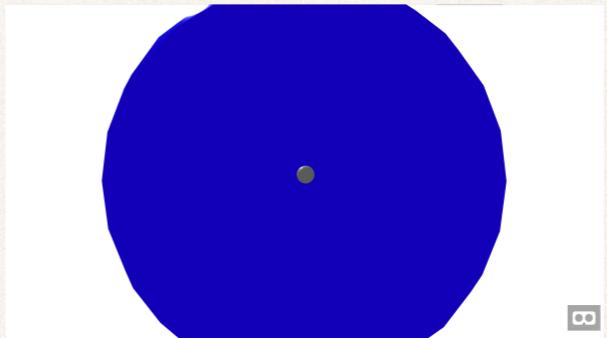
Blue-blindness
(tritanopia)



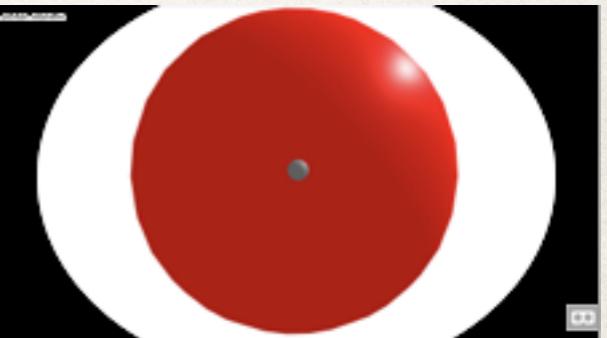
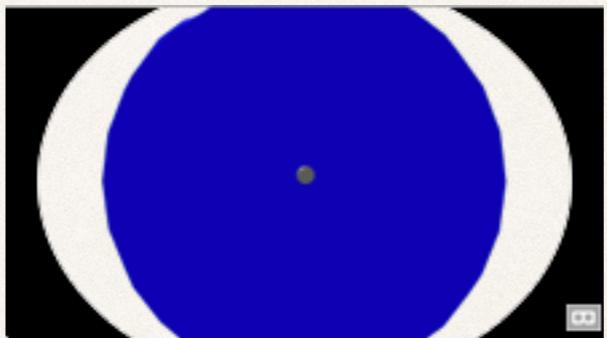
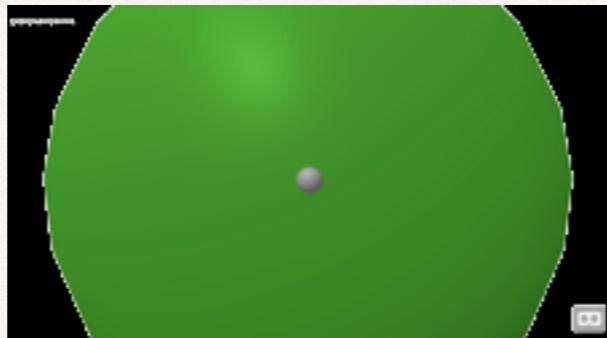
Red-blindness
(protanopia)

e-Scan: Glaucoma / Retinitis Pigmentosa

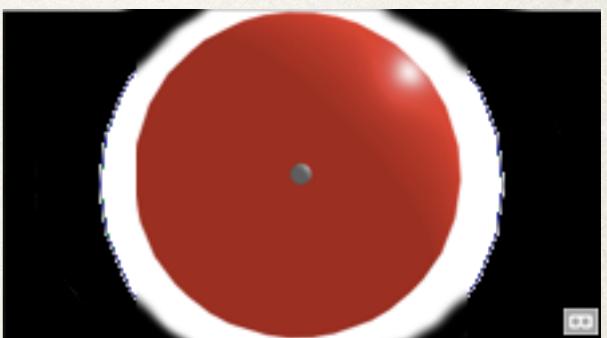
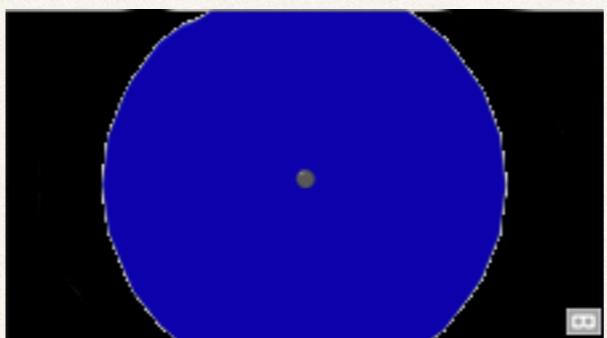
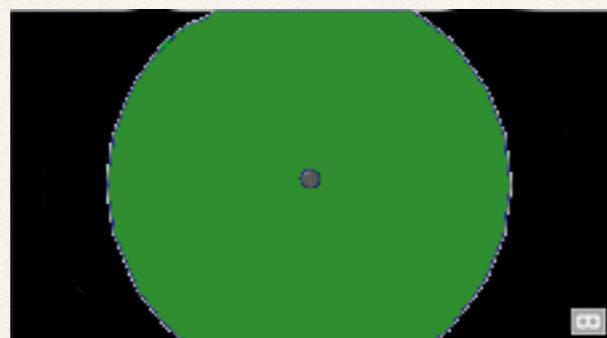
Benchmark:
Normal Vision



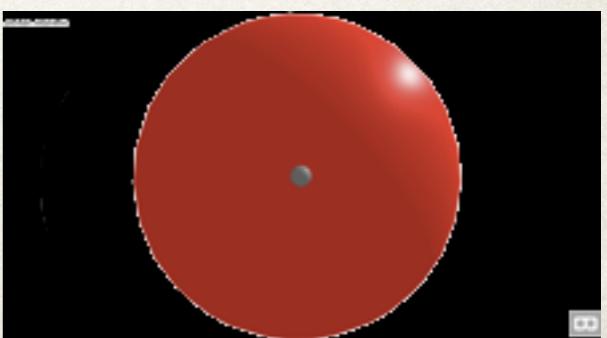
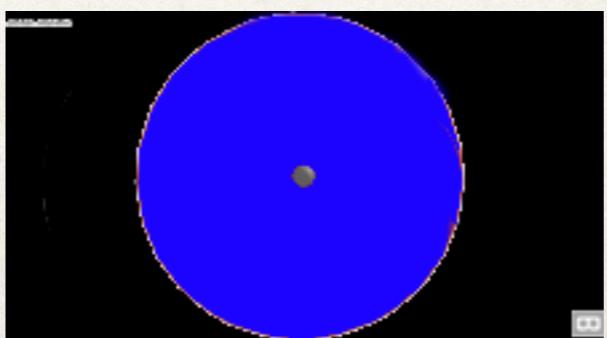
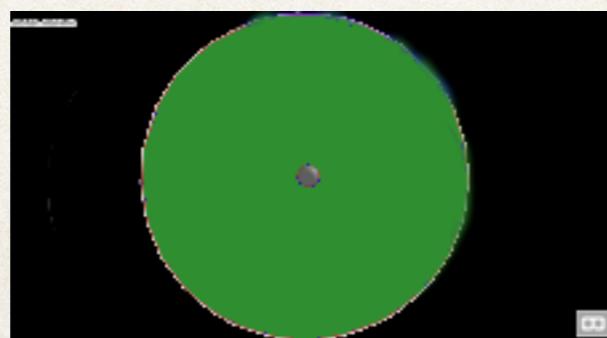
Early stage



Advanced stage

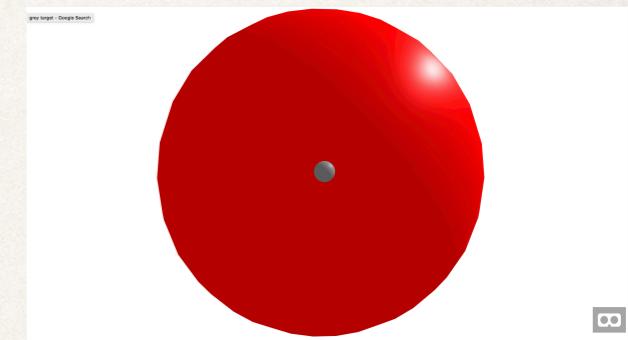
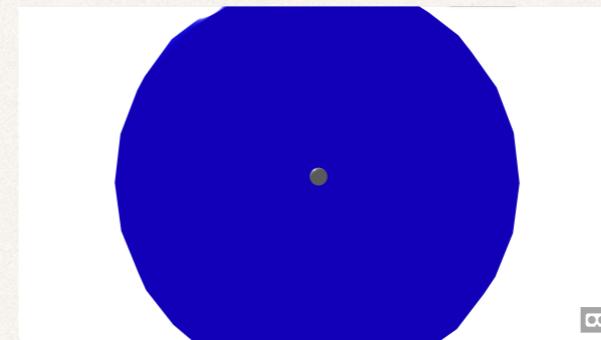


Extreme stage

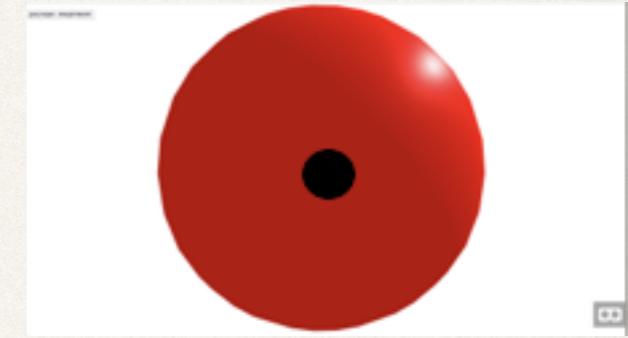
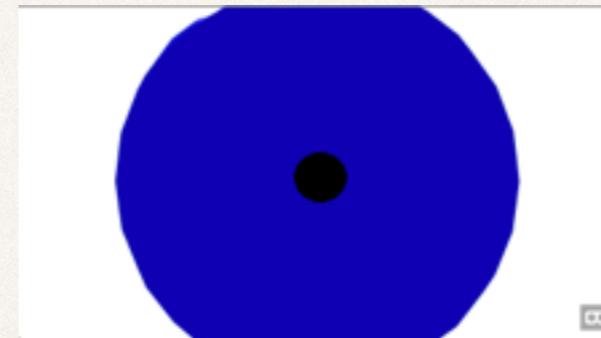
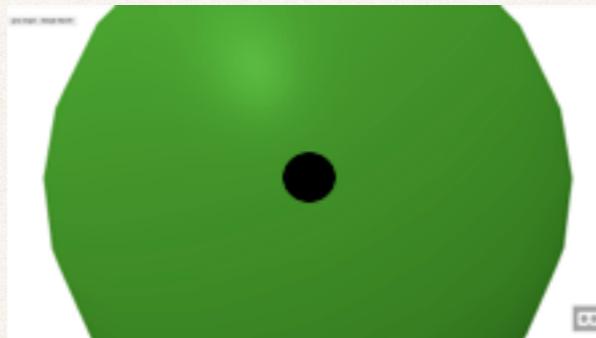


e-Scan: Aged-Related Macular Degeneration

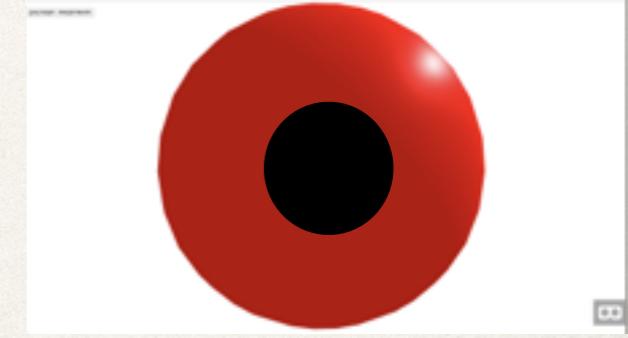
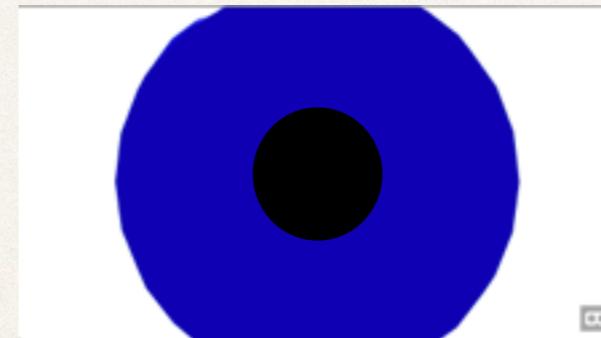
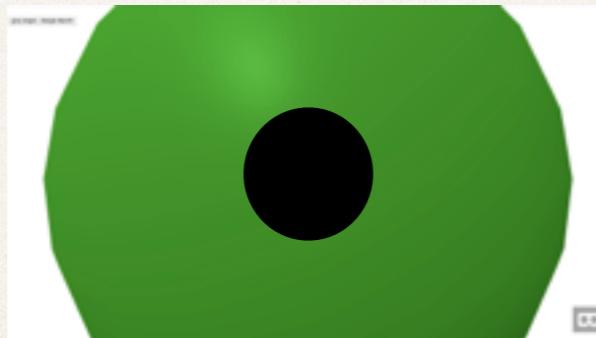
Benchmark:
Normal Vision



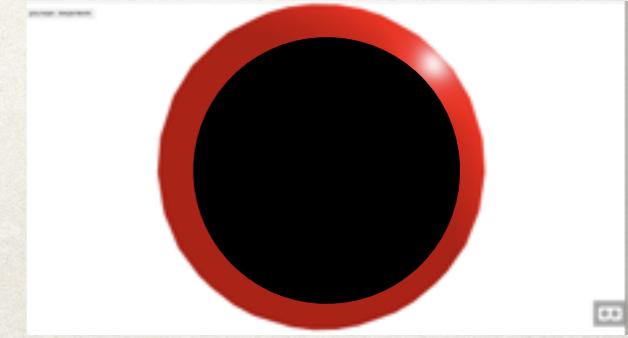
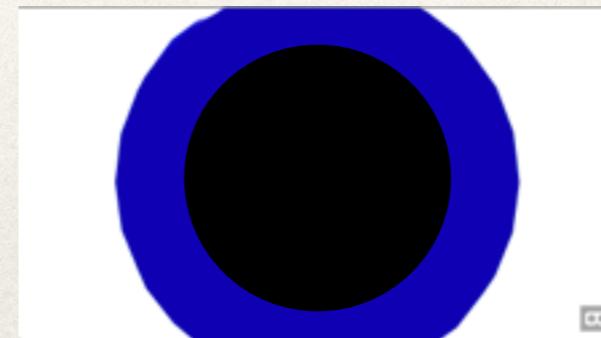
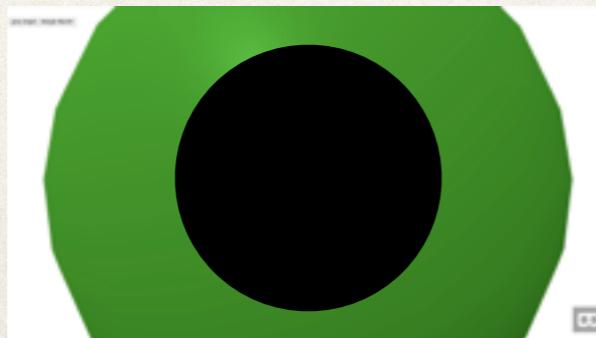
Early stage



Advanced stage



Extreme stage



e-Scan: Check it out!

<https://e-scan-cb.glitch.me/>

e-Scan: Next Steps...

- ❖ Speak with specialists
 - ❖ 2 types: “indoor” and “outdoor” doctors
 - ❖ Collect feedbacks (in terms of accuracy, ease of use, etc.)
 - ❖ Design/execute real test cases (patients)
 - ❖ Expand “test cases”
 - ❖ New uses (self-analysis, etc.)
- ❖ Technical part
 - ❖ Offline deployment
 - ❖ Find out different ways to leverage A-frame
- ❖ Find partnerships (PeekVision.org)

Thank you!

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