

FOCAL

A wearable to track visual behaviour

Objective data to improve outcomes in primary and secondary ophthalmic care.



WHAT IS THE PROBLEM?

Visual behaviour is based on patient recall

2°

Secondary care

Surgeons choose a permanent lens target (near, intermediate or distance) based on questionnaires and patient recall.

Px

Patient outcomes

Little structured feedback on whether the lens chosen matched the patient's life.

1°

Primary care

Optometrists recommend solutions, services & refer with no objective record of how each patient uses their vision day to day.

13 mil

NHS sight tests in England

~600,000

cataract operations in England

PROBLEM STATEMENT



How can we provide an objective measure of visual behaviour?

Objective

Measured from the eye itself, not from what patients remember

Inclusive

Works for patients with cognitive impairment or who are non-verbal

THE IDEA

Introducing Focal



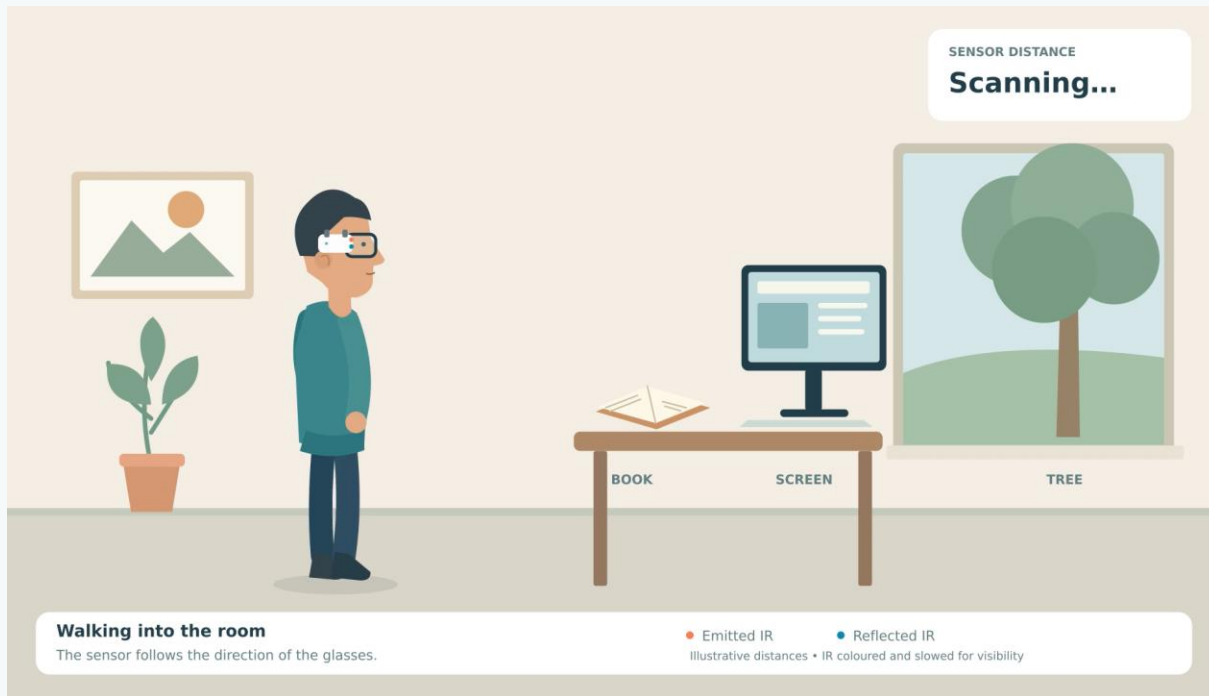
How does it work?

V1

Laser

Distance to target

A laser rangefinder measures how far away the object in the line of sight is.



How does it work?

V2

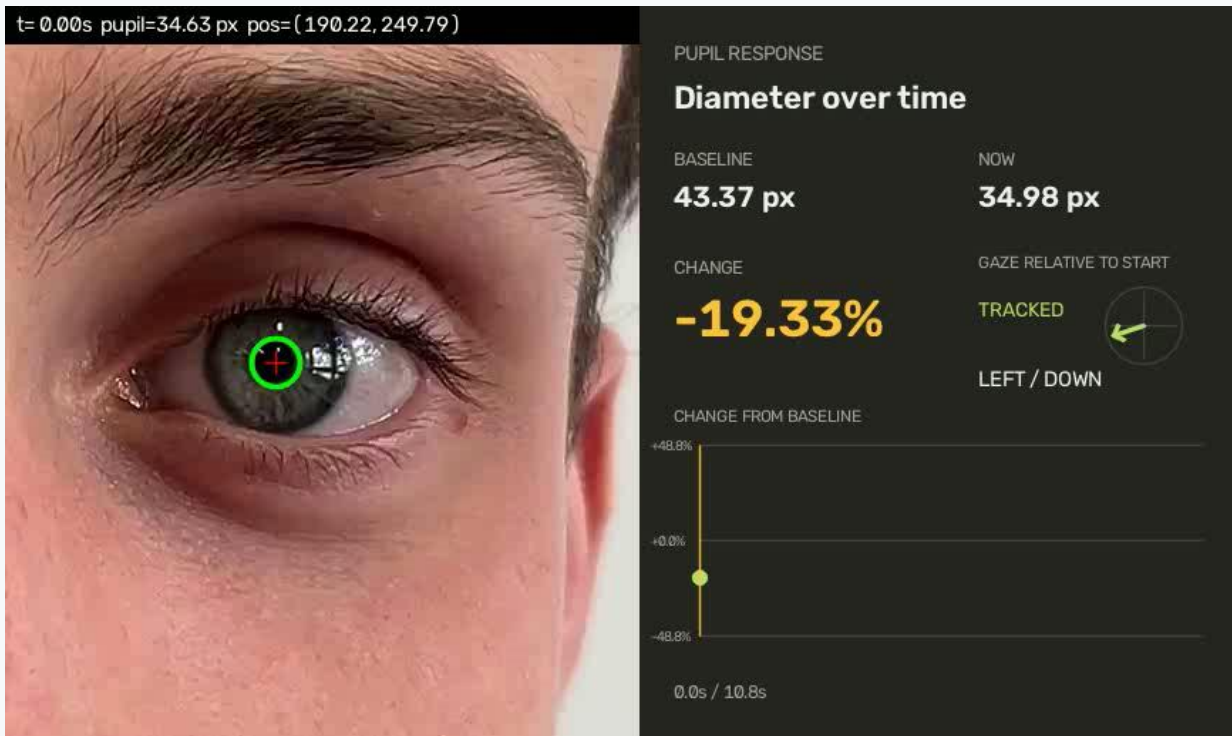
Focus response

An infrared sensor tracks pupil diameter.

The **pupil constricts** when focusing up close and **dilates** while looking in the distance

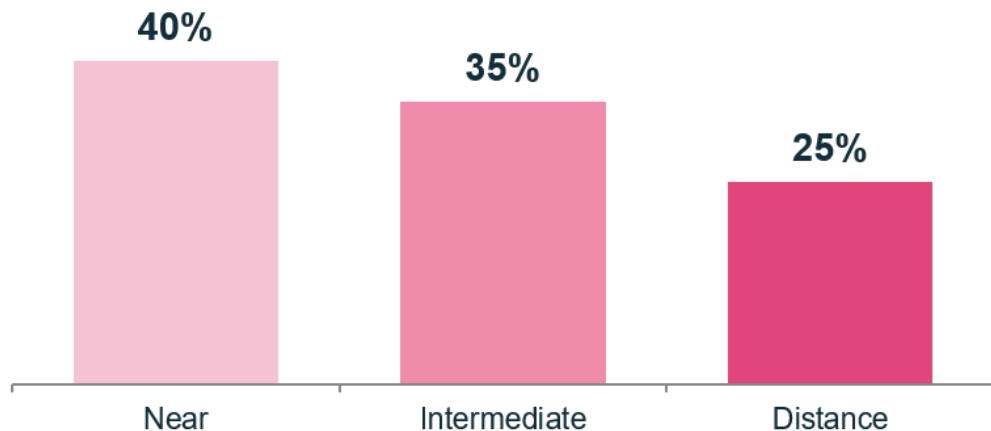
Light monitor

The pupil responds to light. Measuring light data provides context to calibrate our distance calculations



What the clinician sees

Share of viewing time by distance



Dominant eye **Right**

Readings light-corrected **100%**

What it tells the clinician

- 1 Mostly near vision**
Reading, phone and close work lead the day.
- 2 Right eye dominant**
Helps plan which eye gets which lens.
- 3 A clear starting point**
Real-world evidence to discuss lens options with the patient.

Multiple Measures, Multiple Uses

NOW

Cataract lens choice

Device clipped on pre-assessment

Objective data on near, intermediate and distance use to pick the right lens target.

NEXT

Spectacle Lens choice

Fitted to patients along clinical (non-verbal, cognitive, myopia) or dispensing (bespoke) pathway

Guide better conversations and lens options for the dispensing process

LATER

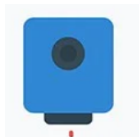
Attention

Integrated into wearable technology

Tracking where and how long people focus to support attention assessment.

COSTS

What it costs to build (MVP)



Time of Flight Sensor

£16.50¹ (retail price)



Ambient Light Sensor

£10.50² (retail price)

Estimated cost per unit

£27

¹ VL53L1X Time of Flight (ToF) Sensor Breakout - The Pi Hut

² BH1745 Luminance and Colour Sensor Breakout - The Pi Hut

COSTS

What it costs to build



Infrared sensors

2 pupil cameras, IR lights
and lens film

£9.50

£15 for a first run of 100



Distance + light

Laser rangefinder and
ambient light sensor

£3.80

£4.50 for a first run of 100

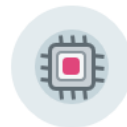


Casing

Left and right clip shells

£3

£17 for a first run of 100



Electronics

Processor, battery, boards,
build and test

£18

£32 for a first run of 100

Estimated cost per pair

At 1,000 units · £68 for a first run of 100

~£35

Plus ~£15–30k one-off for injection moulds and safety testing. Estimates from 2026 supplier prices, excl. VAT and margin.

Go-to-Market

Secondary care

- Reusable device at low marginal cost
- Reduces IOL exchanges and revision procedures



Private sector

- Personalised, data-backed lens matching
- Increased willingness to pay for premium lenses



Primary care

- Bespoke, chargeable patient assessment
- Increases conversion from routine eye tests to premium-lens referrals

BUSINESS MODEL

Low cost devices - long-term dashboard subscription

Focal



Questions?