Team 04 — Portable Digital Stereo Microscope for Ophthalmic Operation Demonstrations

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NOVARTIS

NEED

- *$1.8bn eye surgery market*
- *3D visualization systems facilitate surgical device demonstrations to clinicians*
- *Current solutions for Novartis are too large to transport, limiting feedback from clinicians*

Objective: To design a HD portable 3D digital ophthalmic microscope that Novartis can use to demonstrate devices in non-surgical settings.

DESIGN INPUTS

Contstraints

- Quick & simple setup
- Transportable by plane
- Must accommodate users hands

Requirements

Stereopsis	2.35mm offset
Field of View	52mm
Low Latency	<200ms
Resolution	≥1080p
Frame Rate	≥60FPS

VERIFICATION

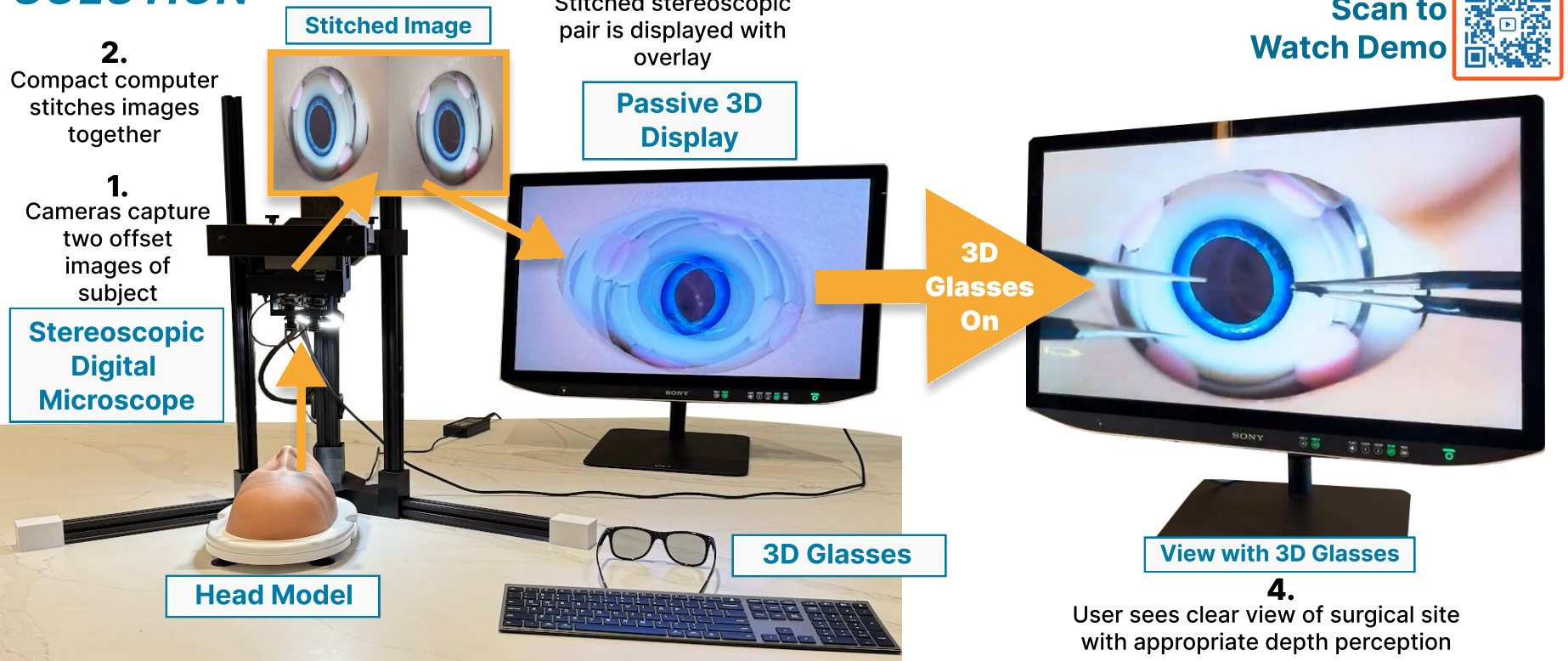
Test	Result
Stereopsis	✓
Field of View	✓
Low Latency	✓
Frame Rate	✓
Setup Time	✓
Weight & Volume	✓

SOLUTION

1. Cameras capture two offset images of subject

2. Compact computer stitches images together

3. Stitched stereoscopic pair is displayed with overlay



Scan to Watch Demo

4. User sees clear view of surgical site with appropriate depth perception

FUTURE

Revisions

Implement Adjustable Focus

Optimize codebase to improve stability

Impact

2x

the number of demonstrations/per year conducted by Novartis

Leading to designs with increased usability for clinicians