Why The New Generation Of AR Smart Mirrors Are Catnip For Fashion And Beauty Retail

Stephanie Hirschmiller Contributor
I cover luxury beauty, fashion and innovation from Paris and London.

Follow

May 19, 2023, 09:54am EDT

Updated Jun 1, 2023, 05:14am EDT

DIVE BRIEF

Makeup by Mario launches AR mirror at Sephora Times Square

The limited-time experience helps users with selecting a shade and product application.

Published June 20, 2024

Future **Technology**

Revolutionising retail: Smart mirrors provide a glimpse of futur shopping

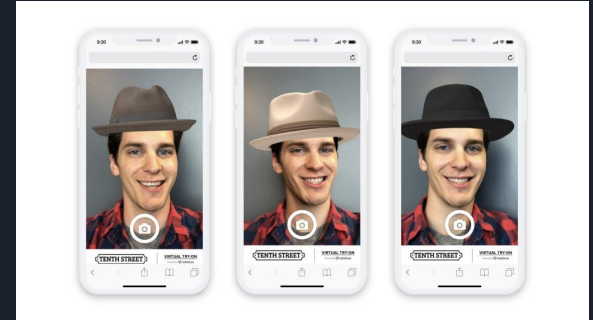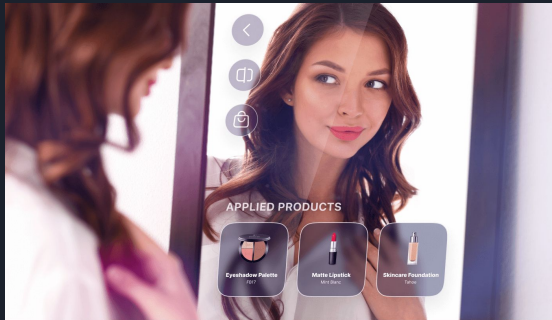Zero10's AR mirror technology allows customers to try on clothes virtually

---

PARTNER CONTENT

Meeting Consumer Expectations Through Augme Reality, In-Store and Online

Zero10 offers digital solutions through AR mirrors, leveraged in-store and in window displays, to brands like To Co-founder and CEO George Yashin discusses the latest advancements in AR and how fashion companies can le boost consumer experiences via retail touchpoints and brand experiences.

Virtual Mirror Market Size to Worth USD 76.55 Billion by 2032, at a CAGR of 24.63 | Exclusive Report by SNS Insider

A key driver of the Virtual Mirror Market is the increasing demand for personalized and immersive shopping experiences, particularly in retail and fashion.

January 13, 2025 08:00 ET | Source: SNS Insider pvt ltd   Follow

---

*How are brands accessing the **$56B** augmented reality opportunity?

Brands are diving into the augmented reality market en masse to help solve pain points, improve consumer experience, and strengthen their storytelling.

Bethanie Ryder
Jing Meta Editor & Fashion Writer

1

Use Case

Augmented reality (AR) mirror that is a display like conventional mirrors but with virtual objects or effects

Use Case (Cont.)

UsAR Mirror

Alignment

Multiple Viewpoints

Kinect depth sensors

Software-based reconstruction

Cameras + LED lights

Display technologies

Use Case (Cont.)

Hardware Systems
Jetson GPU processing, Kinect depth cameras

UsAR Mirror

Computer Vision (CV) & Software Systems
AR overlays, gesture recognition

Human-Computer Interaction
real-time responsiveness
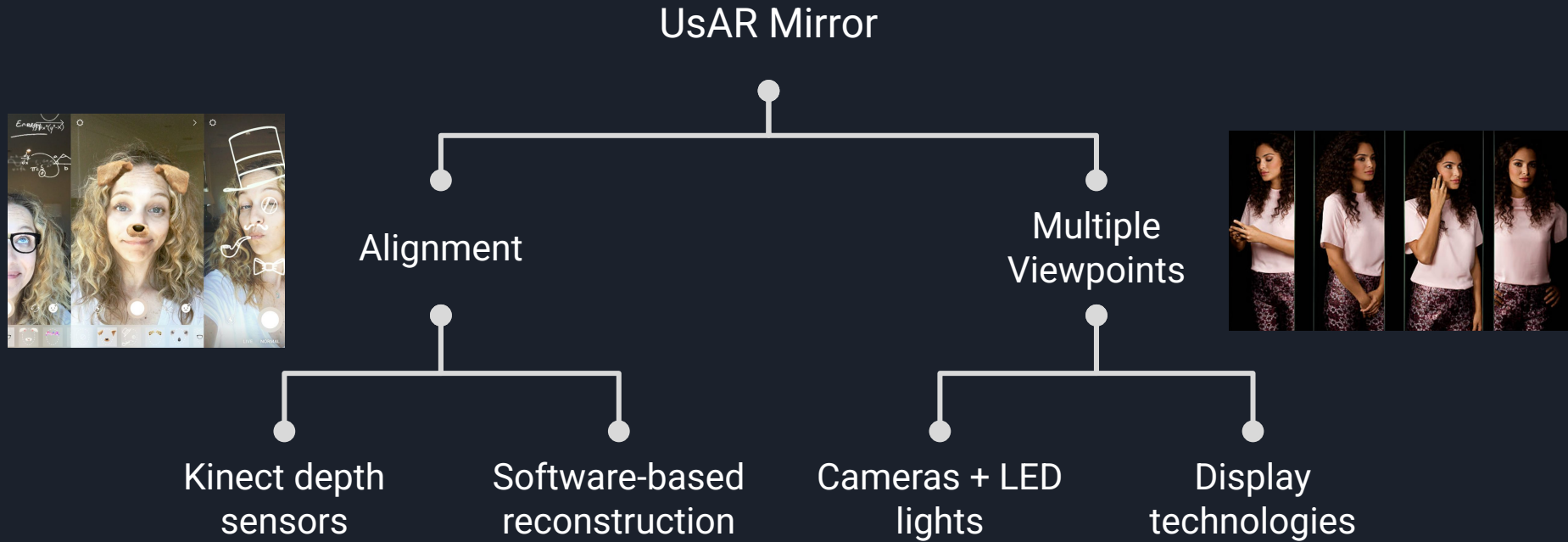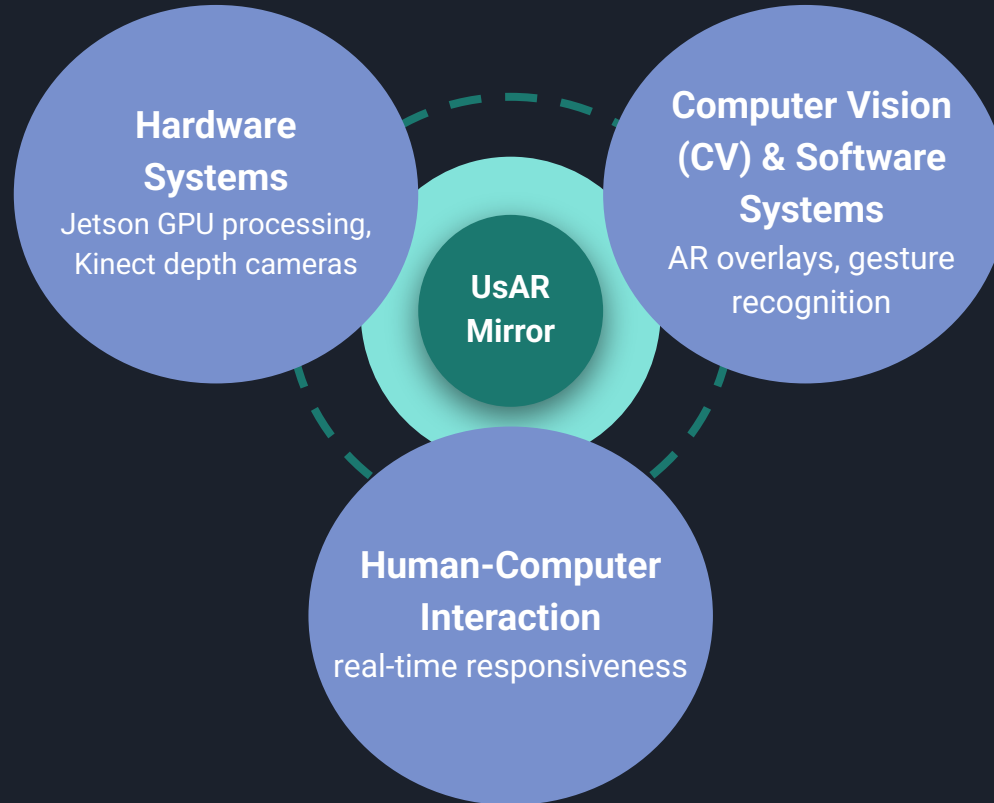
Use Case Requirements

1	Interact with it in real time	• Frame rate: ≥ 15 frames/second • Latency: ≤ 200 milliseconds
2	Freely select target view of themselves	• Tracking accuracy: ≥ 90% • Angle coverage: ± 90° from front view
3	Screenshot and save photos of themselves on the display	• Storage capacity: ≥ 100 images
4	Navigate the menu or make a selection using hand motions	• Recognition accuracy: ≥ 90% • Swipe up/down and left/right

Technical Challenge #1: Real-time

Solution

Problem

Delays in gesture recognition and associated action on the display

Graphics Processing Unit (GPU) for rendering virtual objects in real-time
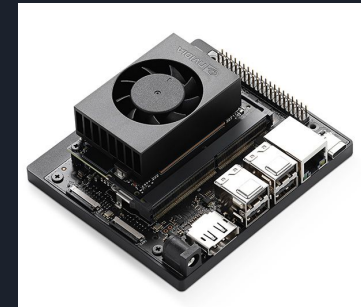
Central Processing Unit (CPU) for parallel processing/multi-threading

6

Technical Challenge #2: Tracking Accuracy

Solution

Problem

Gesture
Misrecognition

OpenCV
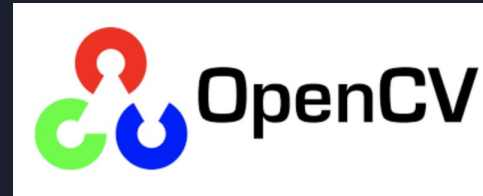
CV libraries for real-time object segmentation of different objects and scenes, object detection & recognition, 3D surface reconstruction, camera calibration that supports angles exceeding 180°

Technical Challenge #3: Multiple Viewpoints

Solution

Problem

Incomplete view of their face from different angles

Azure Kinect DK
Developer kit with advanced AI sensors for building computer vision and speech models

Technical Challenge #4: UI

Solution

Problem

Problems with UI overlays
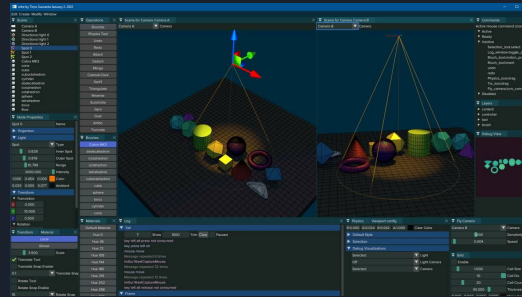
Basic immediate mode UIs (Dear ImGui) or more complicated UIs (qt or gtk) for enabling user interaction

Thorough testing/feedback for figuring out which gestures are most intuitive + accurate

Testing, Verification and Metrics

1

≤200 ms latency

High-speed logging scripts

2

90%+ gesture recognition accuracy

Controlled tests

3

Integration Testing

Hardware + software interaction

4

2-hour stress tests

System reliability

5

User Feedback

Responsiveness and ease of use
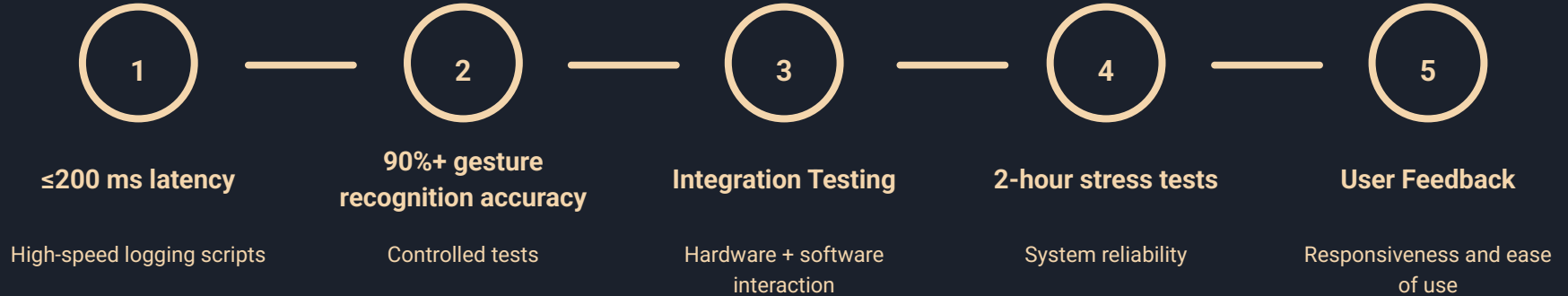
Tasks and Division of Labor

Steven

- ❏ Eye-tracking
- ❏ Gesture Recognition

Details:

Develop/integrate algorithm into the mirror

Anna

- ❏ Camera feedback
- ❏ UI development

Details:

Controlling camera using motors based on user inputs

Writing/integrating algorithm to have filters displayed on the mirror

Catherine

- ❏ Distortion algorithm
- ❏ AR overlay (3D reconstruction)

Details:

Writing/integrating algorithm for perspective alignment

Schedule

2025

| | Feb | Mar | Apr |

Spring Break (Slack) • Mar 1 - Mar 9

Eye-Tracking Core Implementation • Jan 29 - Feb 5

Eye-Tracking Advanced Feature Implementation • Feb 5 - Feb 12

Eye-Tracking Testing & Debugging • Feb 12 - Feb 19

3D Facial Reconstruction Pipeline Design & Implementation • Jan 29 - Feb 5

Depth Sensor integration & Calibration • Feb 5 - Feb 12

3D Facial Reconstruction Testing & Debugging • Feb 12 - Feb 19

Camera System Prototype Assembly • Jan 29 - Feb 5

Camera System Initial Testing & Debugging • Feb 5 - Feb 12

Camera System Performance Evaluation & Calibration • Feb 12 - Feb 19

Gesture Recognition Algorithm Development • Feb 19 - Feb 26

Gesture Recognition Algorithm Refinement • Feb 26 - Mar 1

Gesture Recognition Algorithm Refinement • Mar 9 - Mar 11

Gesture Recognition Testing • Mar 11 - Mar 18

3D AR Overlay Shader & Effect Prototyping • Feb 19 - Feb 26

3D AR Overlay Integration with AR System • Feb 26 - Mar 1

3D AR Overlay Integration with AR System • Mar 9 - Mar 11

3D AR Overlay Final Refinement & Testing • Mar 11 - Mar 18

User Interface (UI) Wireframing • Feb 19 - Feb 26

UI Frontend Implementation • Feb 26 - Mar 1

UI Frontend Implementation • Mar 9 - Mar 11

UI Testing & Refinement • Mar 11 - Mar 18

Software Pipeline Integration & Testing • Mar 18 - Mar 25

System Integration & Testing • Mar 25 - Apr 1

System Performance Testing & Refinement • Apr 1 - Apr 8

Proposal Presentation • Jan 22 - Feb 2

Design Presentation • Feb 2 - Feb 16

Design Report • Feb 2 - Feb 28

Interim Demo • Feb 28 - Apr 2

Final Presentation • Apr 2 - Apr 20

12