Shreeyak Sajjan, Drew Sirenko

Fall 2021 COMS 6998

IKEA?

- International furniture store that designs and sells ready-to-assemble furniture
- 800 million people from 50 countries shopped in the 422 IKEA stores
- Entered the AR space in 2017 with IKEA Place

Inexpensive yet frustrating to build.

icondigital/pixabay.com

Why is Ikea furniture so hard to assemble?

BY OLIVER THOMPSON ON 16/11/2021

THE COUNTRIES WHERE IKEA ASSEMBLY CAUSES THE MOST STRESS

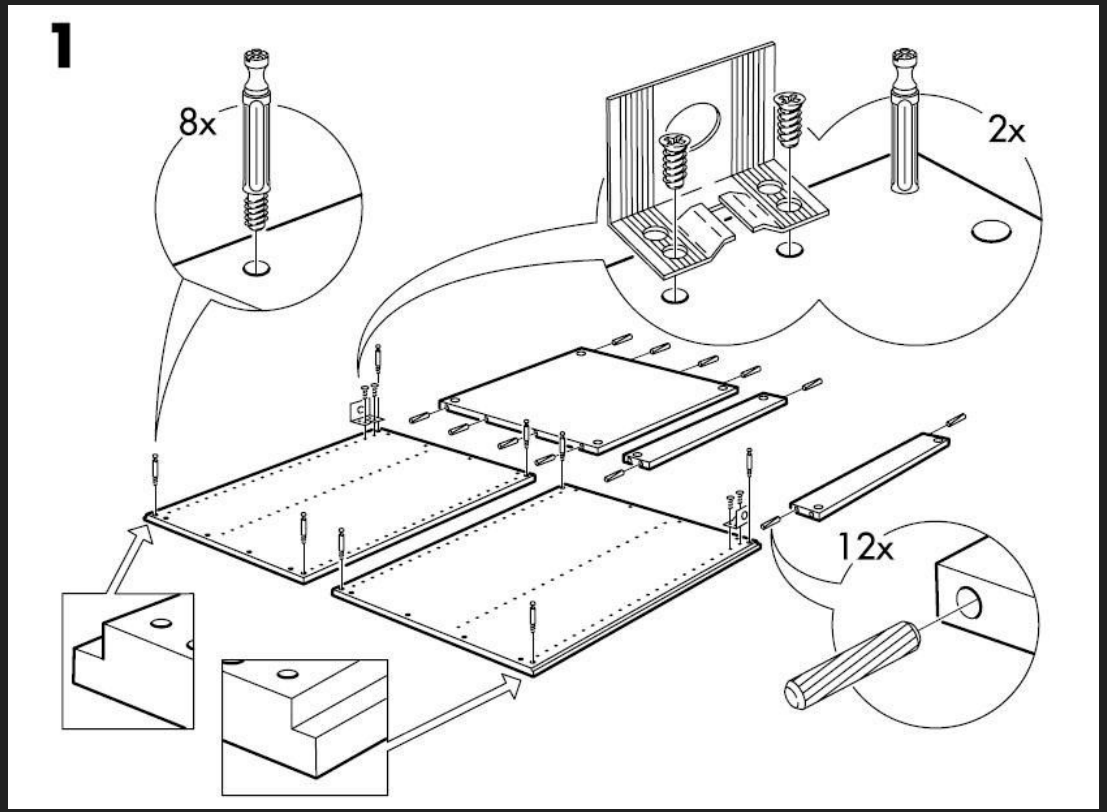
Why Ikea Causes So Much Relationship Tension

The stylish, idealized home in the store's showroom "literally becomes a map of a relationship nightmare," says one psychologist.

yahoo!life

You're Not the Only One Frustrated by IKEA Furniture

Project: Real-time AR based assembly instructions



Previous Work

Task Assistance

S. Henderson & S. Feiner, *IEEE ISMAR 2011*

Assembly & Repair

C. Elvezio et al., *SIGGRAPH VR/AR/MR 2017*

In-Situ Instructions Exceed Side-by-Side Instructions in Augmented Reality Assisted Assembly

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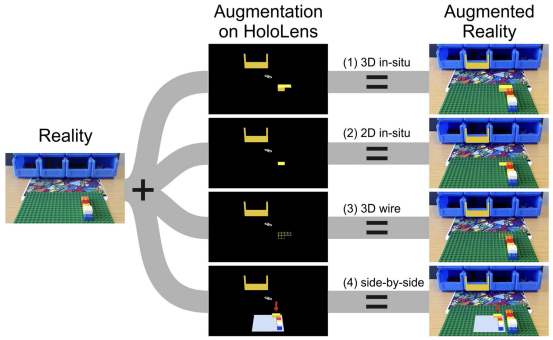


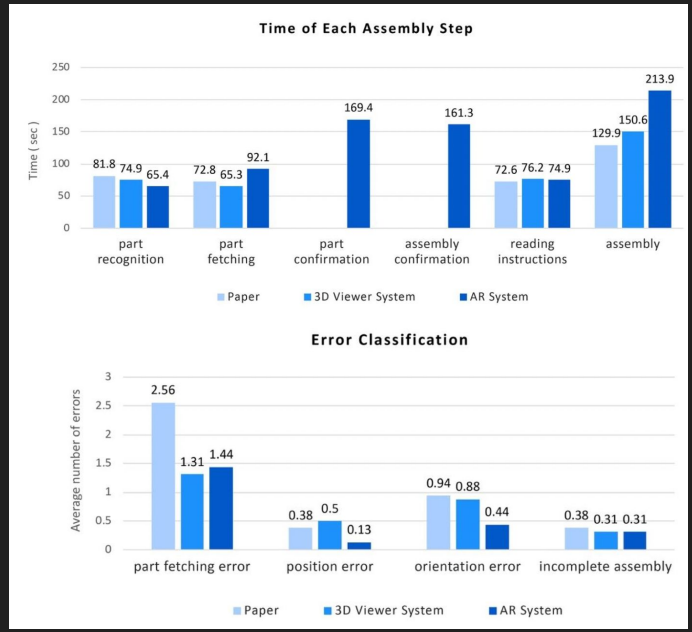
Figure 1: The standardized assembly scenario (Reality), the computerized augmentations on the Microsoft HoloLens (Augmentation) and the result (Augmented Reality). The Augmentations (from top to bottom): 3D in-situ instructions (1), 2D in-situ instructions (2), 3D animated wireframe instructions (3) and side-by-side instructions (4)

applied sciences MDPI

Article

Comparing Augmented Reality-Assisted Assembly Functions—A Case Study on Dougong Structure

Chih-Hsing Chu [1,*], Chien-Jung Liao [1] and Shu-Chiang Lin [2]



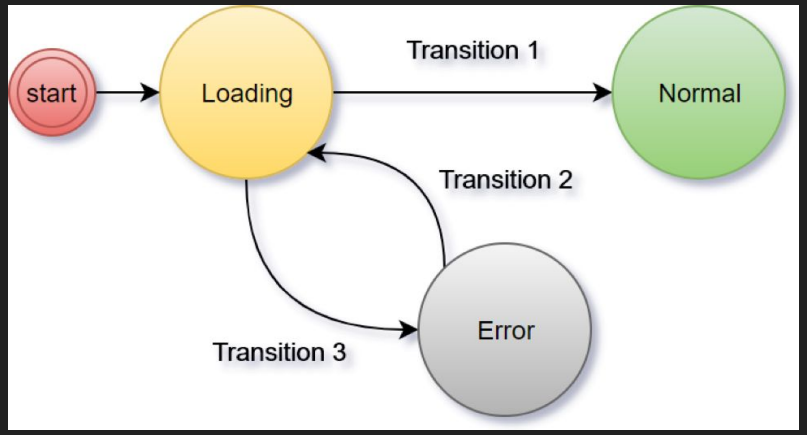
Why AR?

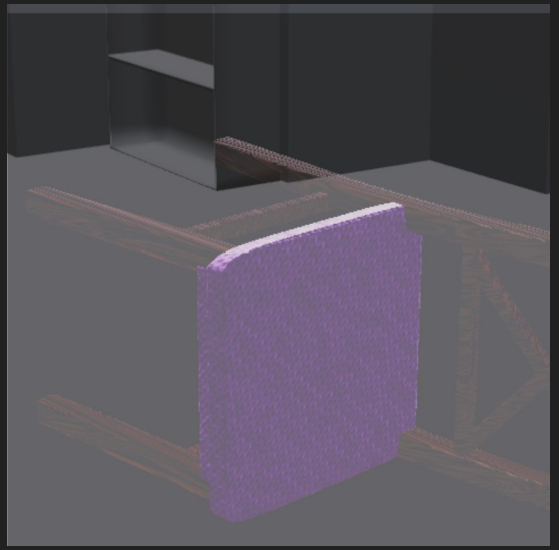
- Intuitive sense of depth and shape you can’t have on paper
- Computer Vision enhancements
- Animations

And why Snap Spectacles?

- Early look at what consumer wearable AR will be
- Hands free and real-world instructions

Project Split





Drew - State Machine and Features

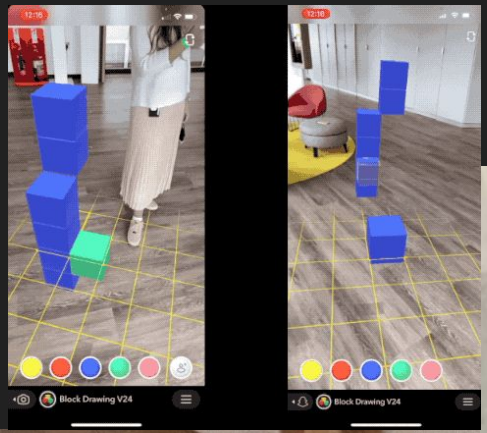
Shreeyak - Meshes and animation

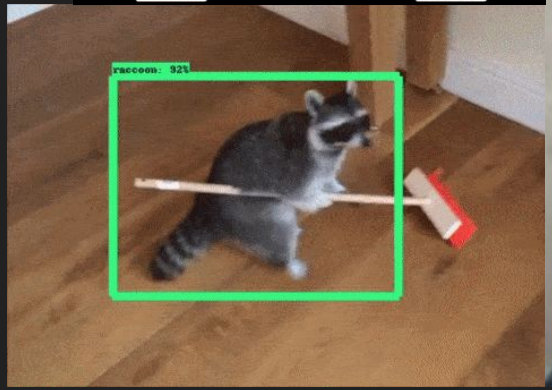
Demo

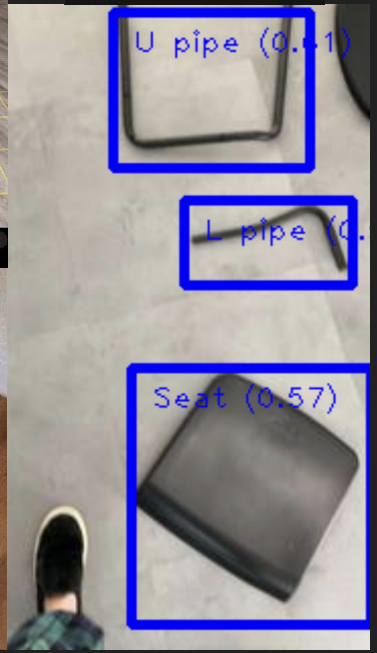
- Set a build location with horizontal plane tracking
- Cycle through assembly steps and animations
- Point to parts of the digital model when holding touchpad
  (For use in connected lenses)

Features that could not be added (yet)

- Voice Recognition (Lens Studio)
- In-app collaboration (Lens Studio)
- Part detection and identification (Computer Vision Challenge)

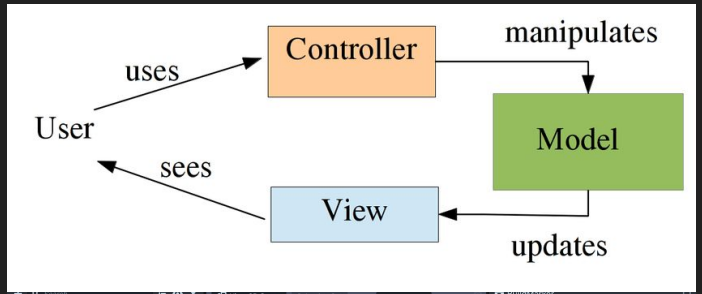


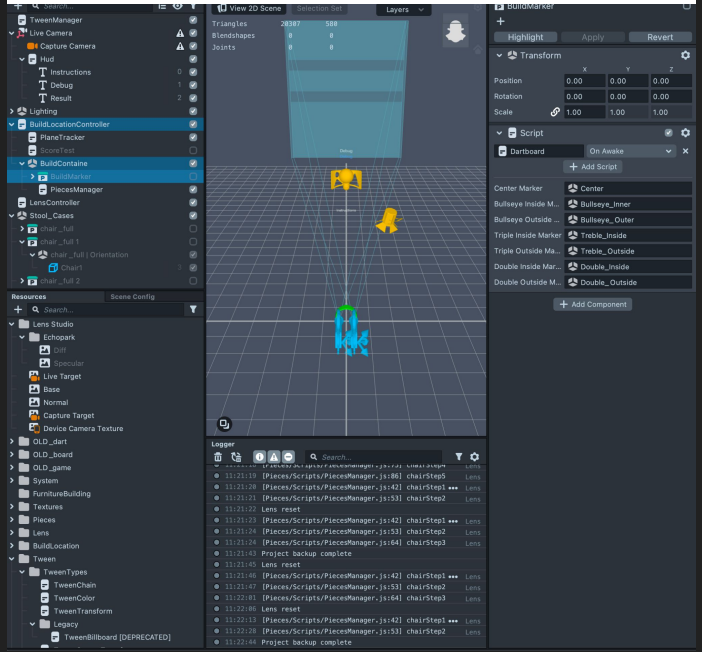




Lessons Learned

- UI for phones ≠ UI for AR
- Setting up interactive systems from scratch
- Language of creating 3D scenes
- Choosing the right dev environment
  - Documentation >>> Features





Future Work

- Real IKEA Assets
- Part detection identification
- Segmentation based markers
- In-app collaboration
- Voice-based UI