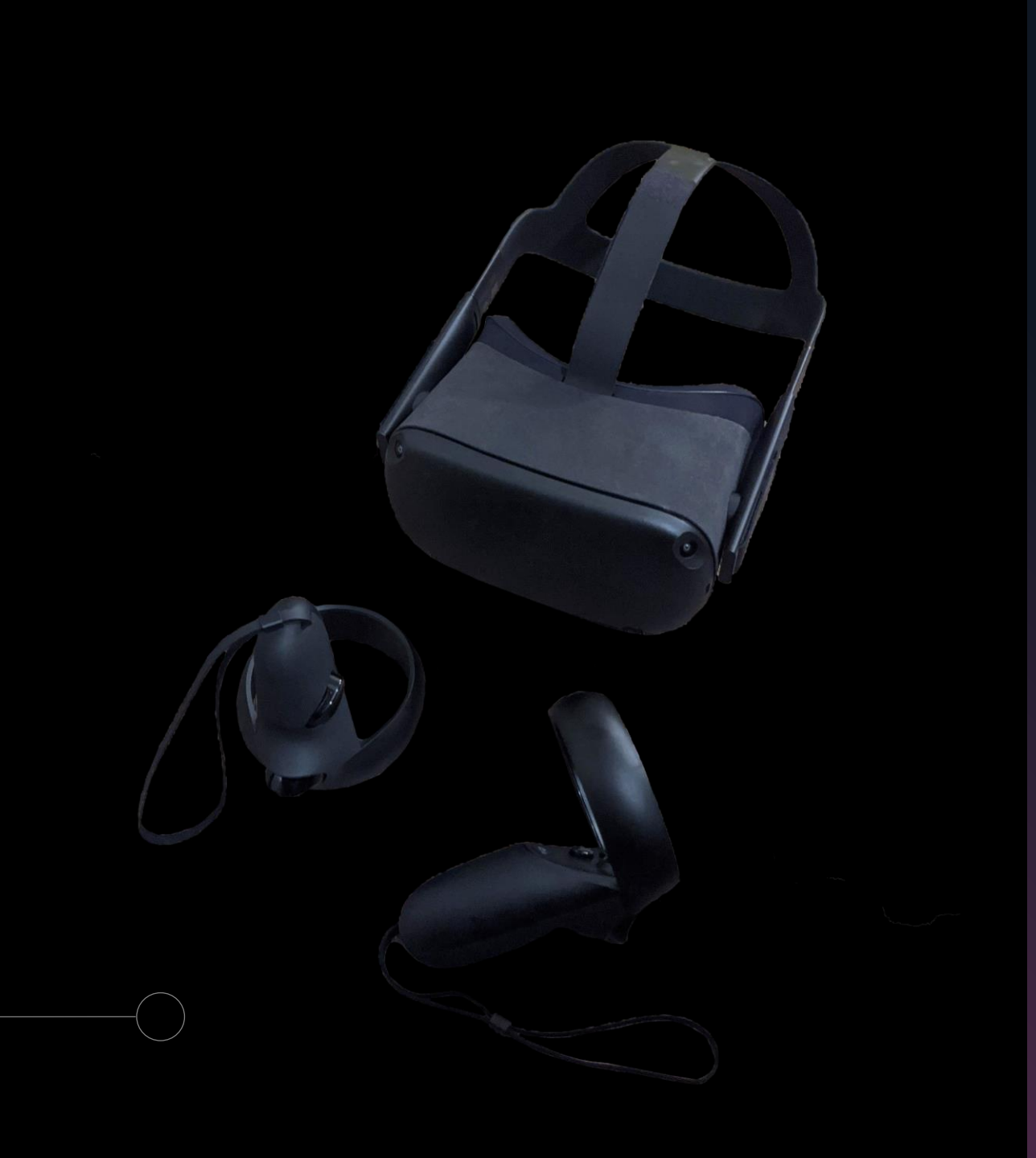


STREAM VR

Real-time updates from VR to Revit

STREAM VR

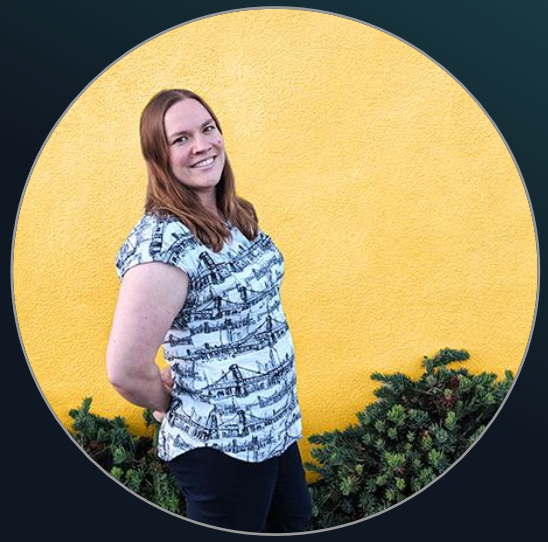
OUR TEAM

Andreas Brake

Topgolf Media

Software engineer, entrepreneur, gamer, outdoor enthusiast

@andreasbrake



Lisa-Marie Mueller

DAHLIN

Architect (TX), artist, programmer, environmentalist, AEC technology blogger

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PROBLEM

A DISCONNECT BETWEEN BIM AND VR

- Floor plans and elevations can be confusing and challenging for clients to understand
- Generally firms stop updating SketchUp models after schematic design
- Even if firms use 3D rendering or build out scenes in Unity or UnrealEngine, there is no connection to BIM
- Client changes made in VR must be manually translated back to Revit and can't be evaluated in BIM and VR simultaneously

STREAM VR

Stream data bi-directionally between Revit and StreamVR to allow designers, clients, and architects to make changes to the model and sync back to Revit in real-time

STREAM VR

DEMO

POWERED BY

STREAM VR

OVERVIEW

hackathon goals

MOVE

PLACE

PAINT

STREAM VR

PROCESS

PLACE

STREAM VR

- Requests family definitions from Revit
- Builds a library of families and associates with local prefabs
- User can select families in different categories to place in the model
- Collects family IDs and position and issues creation command to Revit Add-In

REVIT ADD-IN

- Collects a list of families
- Returns a serialized list
- Processes request and places new family instance in the model at the requested location

STREAM VR

PROCESS

PAINT

STREAM VR

- Requests materials from Revit
- Builds a library of materials and associates with local materials
- User can select and use materials from a pallet
- Use magic wand to paint surfaces
- Collects surface elements and updated material ID and issues paint command to Revit Add-In

REVIT ADD-IN

- Collects list of material IDs and names along with basic properties
- Returns a serialized list
- Processes request and updates surface material in the model

STREAM VR

PROCESS

MOVE

STREAM VR

- Requests family instances from Revit
- Associates family instances with library of model
- Place and render models in VR at the location they are in Revit
- User can move families to desired locations
- Collects family IDs and position and issues moves command to Revit Add-In

REVIT ADD-IN

- Collects a list of family instances
- Returns a serialized list
- Processes request and updates position and rotation of family instance in the model at the requested location

STREAM VR

PROCESS

DATA FLOW

REVIT APPLICATION

NATS BUS

CLIENT APPLICATIONS

FROM_SERVER

TO_SERVER

Reply Channels

VR APP

DESKTOP APP

STREAM VR

LESSONS LEARNED

- Create a properly scoped list of achievables
- Plan your demo at the beginning
- Testing takes at least as long as development
- Bugs always appear minutes before a demo

STREAM VR

THANK YOU!

github
https://github.com/LMA-Studio/enghackathon2020

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resources utilized during the hackathon

FBX files and product data provided by the manufacturer through BIMObject

BIMObject content has been used for VR purposes in accordance with the BIMObject end user license agreement.

Special thanks:

- Valem for Unity VR tutorials
- CC0 Textures for Unity Textures
- Avionx for Unity Skyboxes
- DAHLIN for Revit Software

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The work that we have done during this hackathon is available on our github page and licensed under GPL v3. 3rd party assets utilized for the hackathon and demonstration are not uploaded due to licensing restrictions.

STREAM VR

FUTURE OPPERTUNITIES

IN 7 DAYS THERE IS ONLY SO MUCH YOU CAN ACCOMPLISH,
BUT OUR IDEA GOES FURTHER

1

Hackathon

- Direct import from Revit to StreamVR
- Bi-directional communication to synchronize changes
- Move and place new family instances in VR
- Paint surfaces in VR

2

Phase II

- Allow for family instances to move between different hosts
- Create hosted families
- Additional UI features and functionality
- Light switching
- Rendering, shaders, and material improvements
- Allow users to delete family instances

3

Phase III

- Enhanced dynamic lighting
- Export all families within a linked Revit file as FBX files & import to StreamVR
- Export all materials within a linked Revit file & import to StreamVR

STREAM VR

TIMELINE

6/19 REGISTRATION TO KICK-OFF

- Started watching tutorials on how to use Unity for VR
- Experimented with feasibility of streaming data from Revit
- Stocked up on coffee

6/24 KICK-OFF TO PRESENTATION

- Built out Revit plug-in
- Collected and exported assets for demo
- Developed VR application with Unity to render Revit data
- Hours and hours of debugging
- Polished Quest headset