

# AR MURAL

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**Advisors: Ivan Seskar and Jennifer Shane**



# Introduction



**Nima  
Fallah**

Rising Senior at  
Rutgers-New  
Brunswick



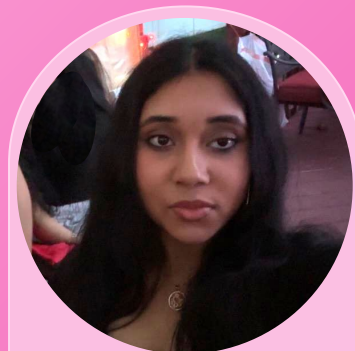
**Jovana  
Lekic**

Rising Junior at  
Rutgers-New  
Brunswick



**Nishi  
Agrawal**

Rising Senior at  
Edison Academy  
Magnet School



**Suhani  
Sengupta**

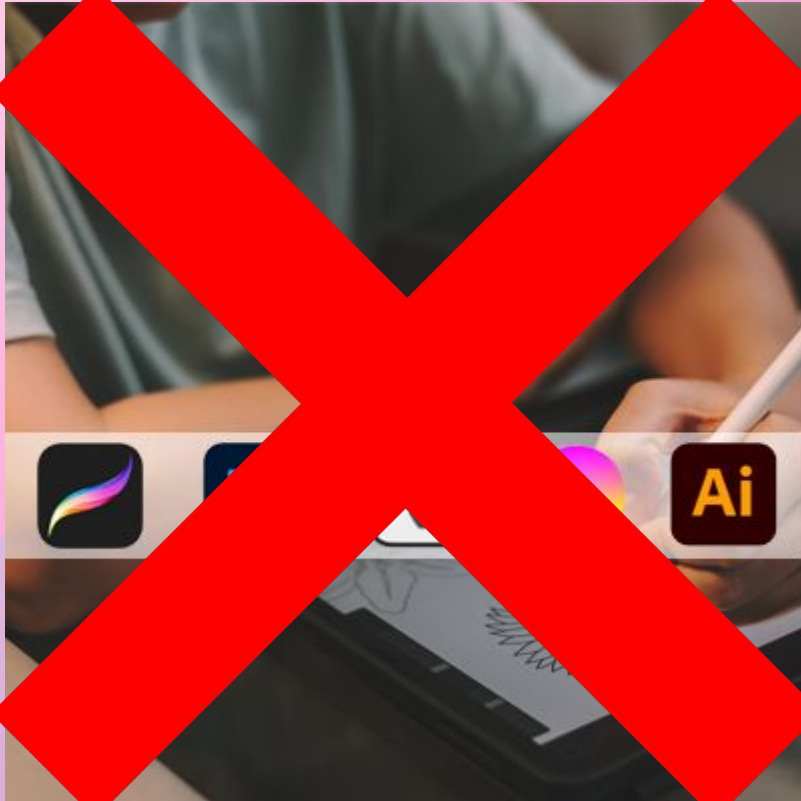
Rising Senior at  
Edison Academy  
Magnet School



**Sachin  
Kandan**

Rising Freshman  
at Henry Gunn  
High  
-California

# The Problem



**TEAMWORK  
IS IN.**

# Our Solution? AR Mural



# Our Tech Stack



**unity**

Game development engine used to simulate the application + MRTK 3



Integrated Development Environment (IDE), “middle man” between Unity and the Microsoft Hololens



Virtual Reality Headset used to deploy the application



**MQTT**

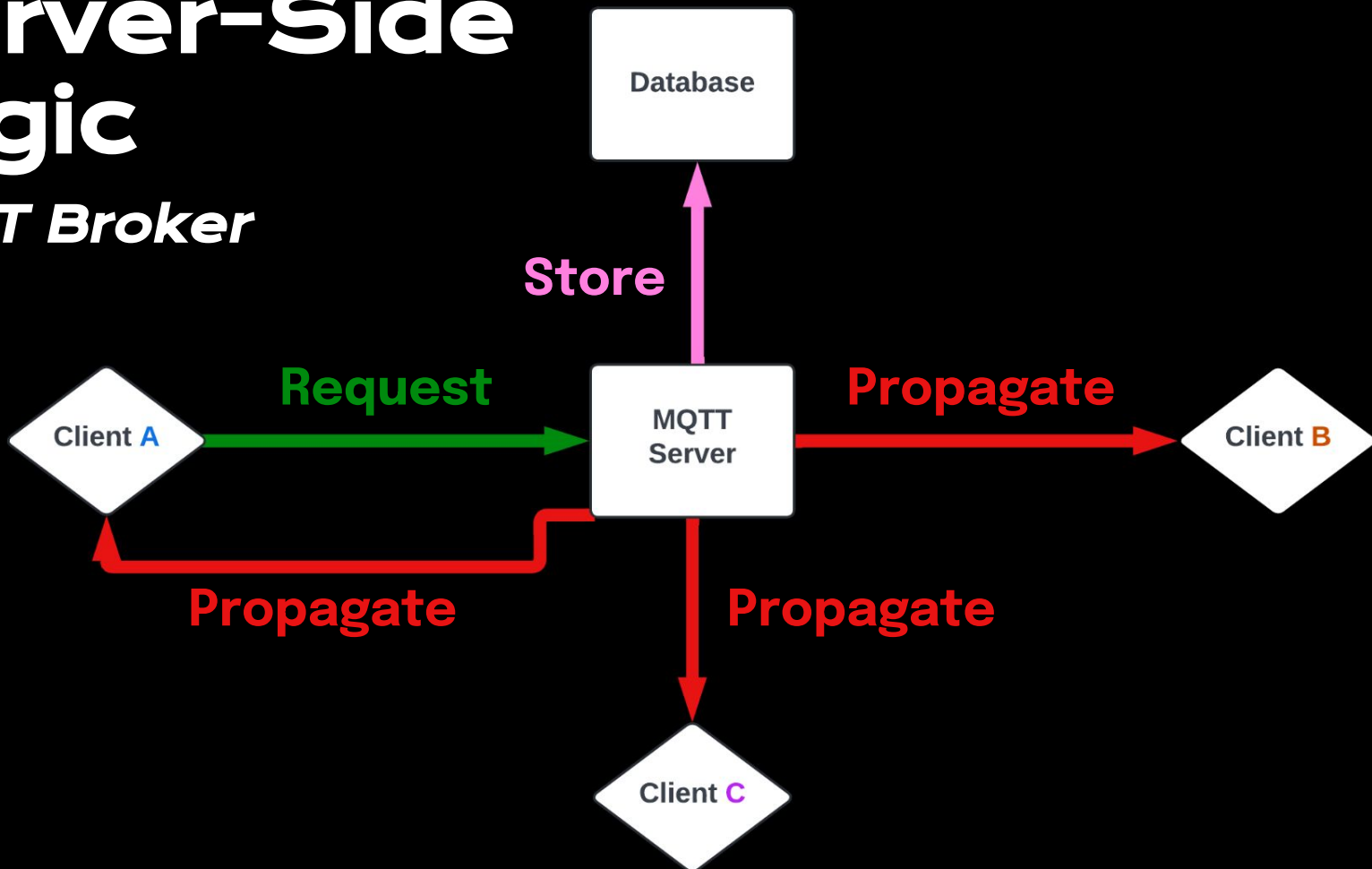
Messaging Queuing Telemetry Transport, Communication protocol used for server to connect users

# Our Features



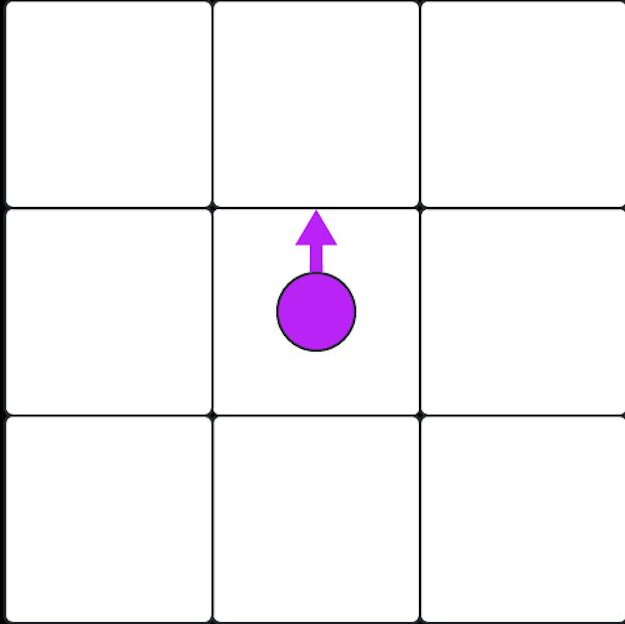
# Server-Side Logic

## MQTT Broker

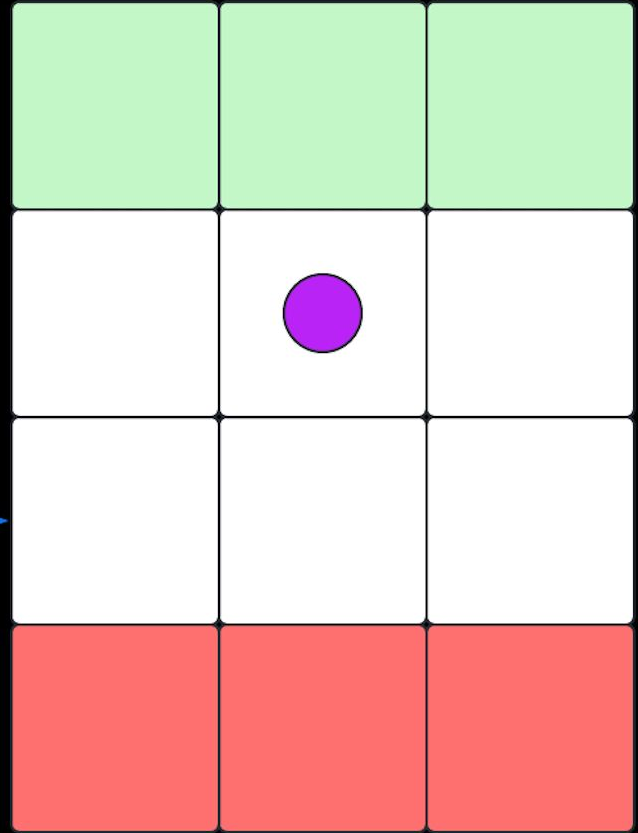


# Client-Side Logic

## *Chunk System*

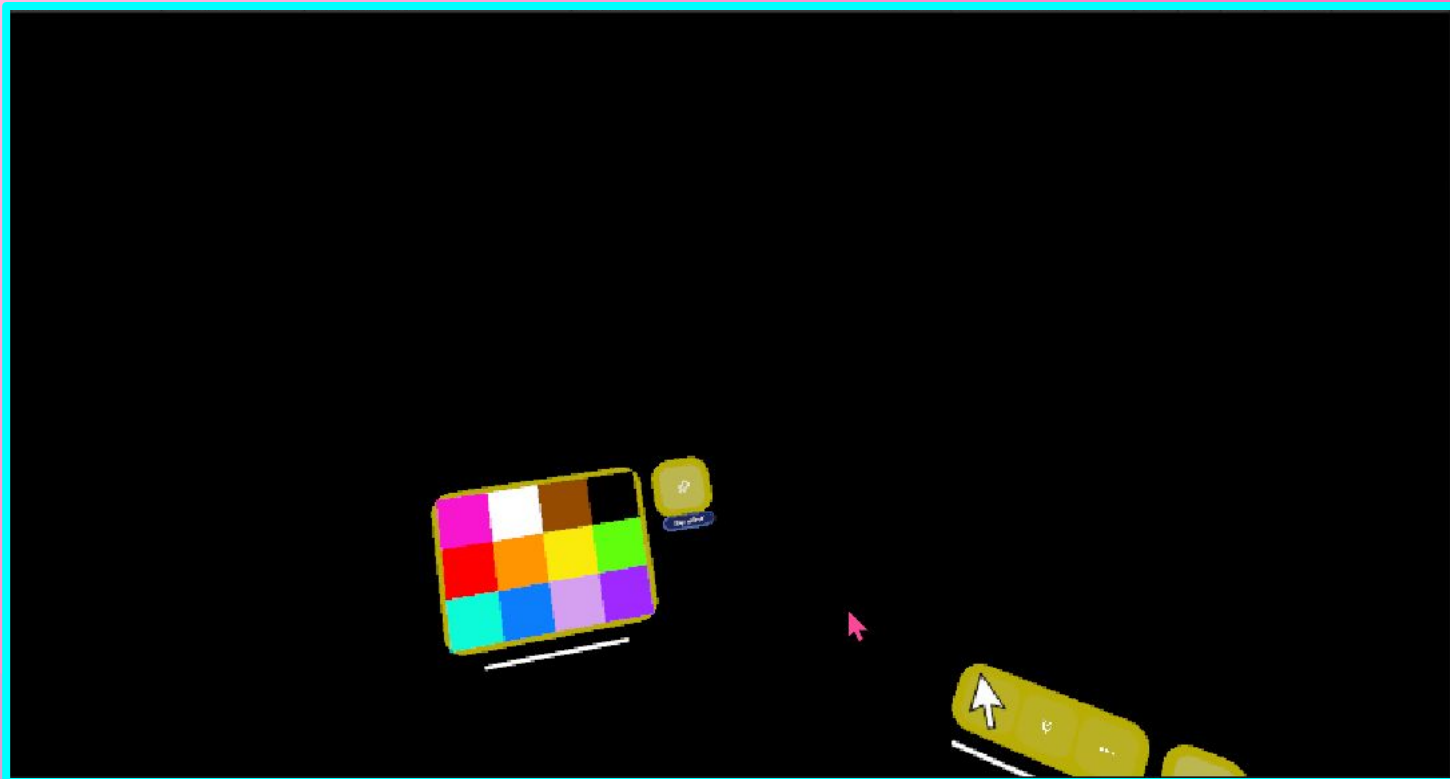
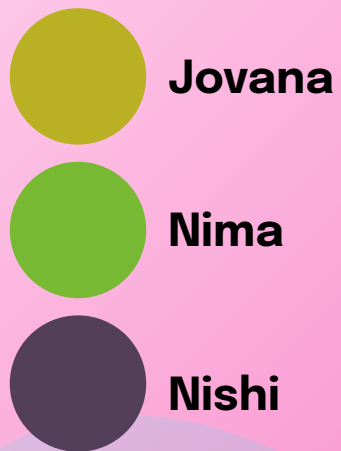


Player Moves





# Collaboration



3 Player Example

# Challenges

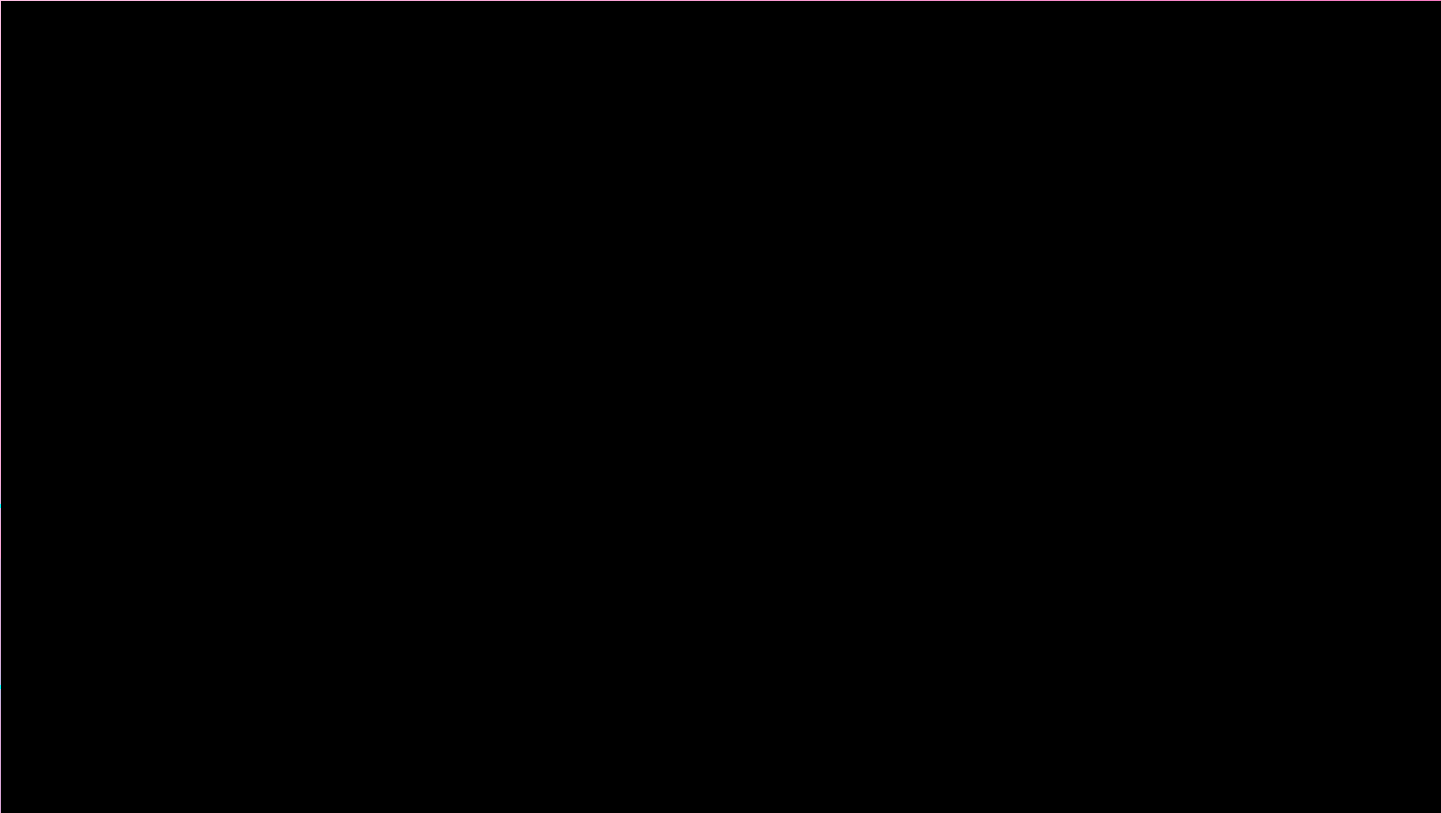
Lack of MRTK3  
Documentation

Program Integration  
with Unity

Localization



# Demo



<https://www.youtube.com/watch?v=wxFEQtGsiKQ>

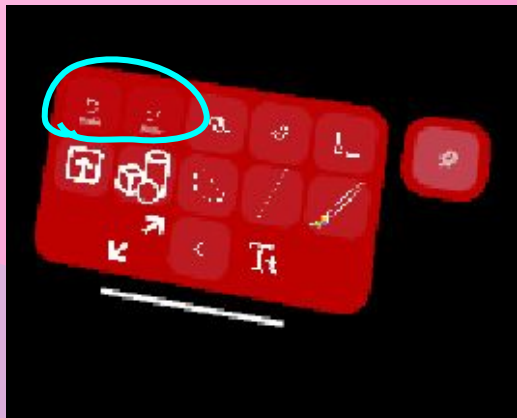
# Look Around



# Future

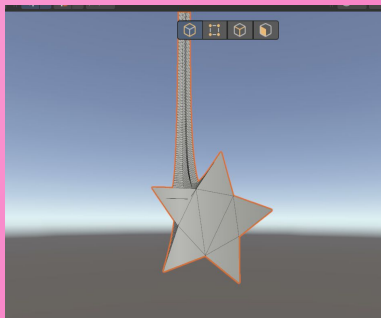
## Undo/Redo

Developing undo and redo functionality



## Shaped line tool

Incorporating a shaped line tool (star shape, etc)

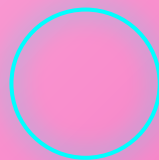


## Geotagging

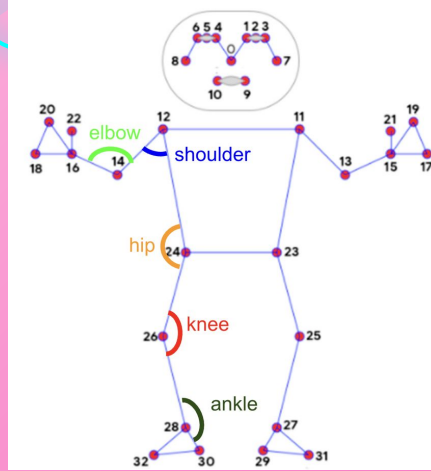
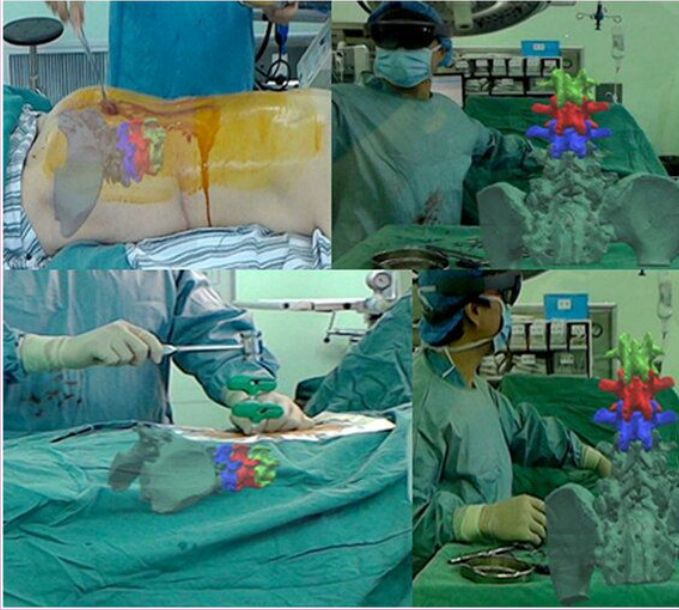
Ability to tie digital murals to physical locations

## Universal

Ability to deploy to various VR environments, including headsets like the Oculus Quest

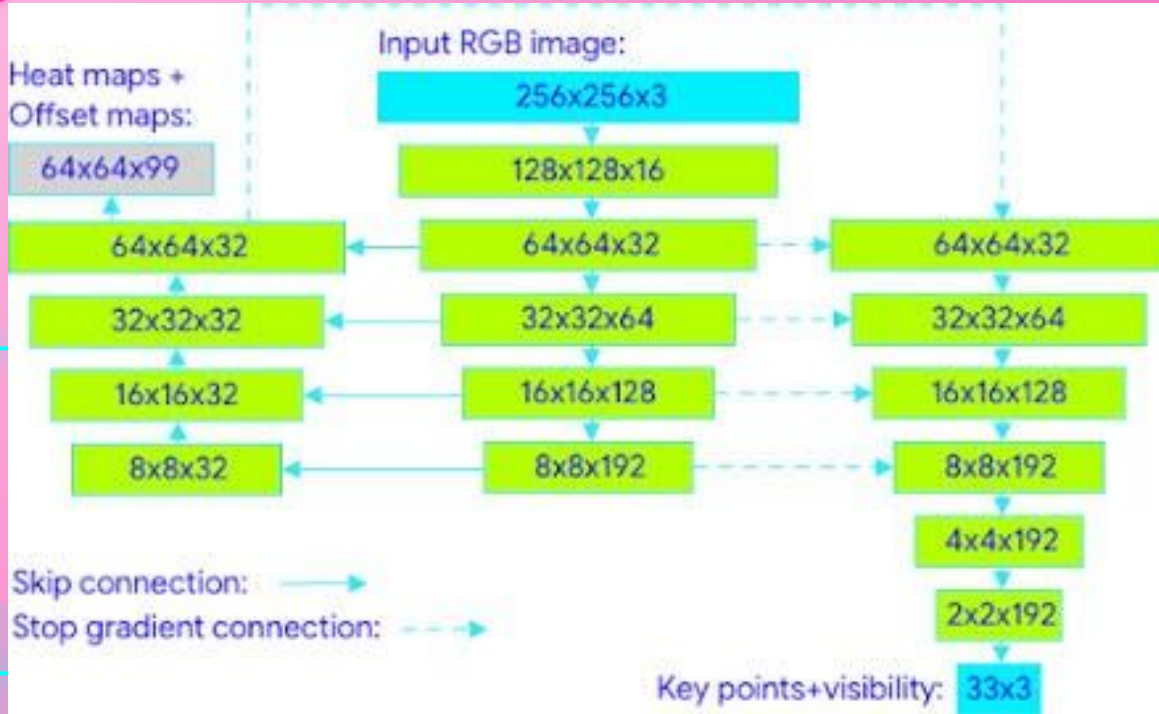


# Overlay



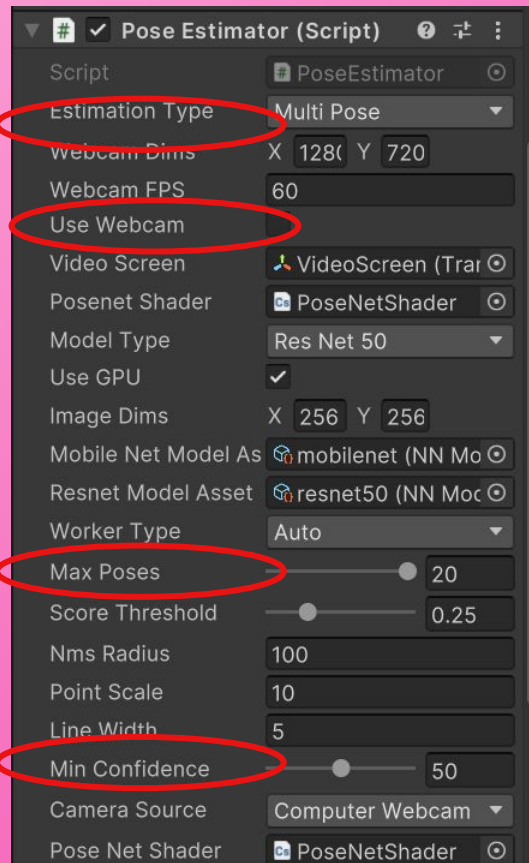


# What is the overlay?



# Overlay Features

- ❑ **Multi-Pose vs Single Pose Toggle**
- ❑ **Video Input Option**
- ❑ **Confidence Level Slider**
- ❑ **Max Poses Slider**



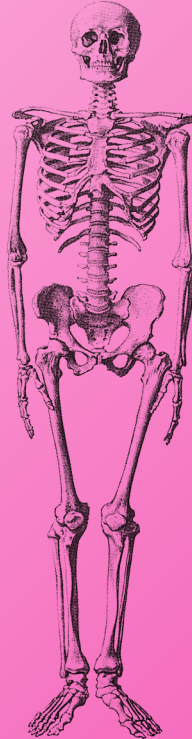


# Pose Estimation



# Future

- ❑ **HoloLens Integration**
- ❑ **Skeleton Attachment**
- ❑ **System Refinement**



# Acknowledgments

**Thank you to Dr. Ivan Seskar and Jennifer Shane for all of their help and support throughout our project this summer!**

**We wouldn't have been able to present before you today without their guidance.**

Showcase

# THANKS!

COME BY OUR STAND AFTER TO  
TRY OUT THE HOLOLENS FOR  
YOURSELF!

QUESTIONS?



Our Wiki Page

[https://www.orbit-lab.org/wiki/Other/Summer/2024/AR\\_Mural](https://www.orbit-lab.org/wiki/Other/Summer/2024/AR_Mural)

