

IMU BASED HAPTIC PERCEPTION WITH AN IMMERSIVE VIRTUAL ENVIRONMENT

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CONTENT

01

SYSTEM
DESCRIPTION

02

SETUP

03

DATA ACQUISITION

04

UNITY
ENVIRONMENT
SETUP

05

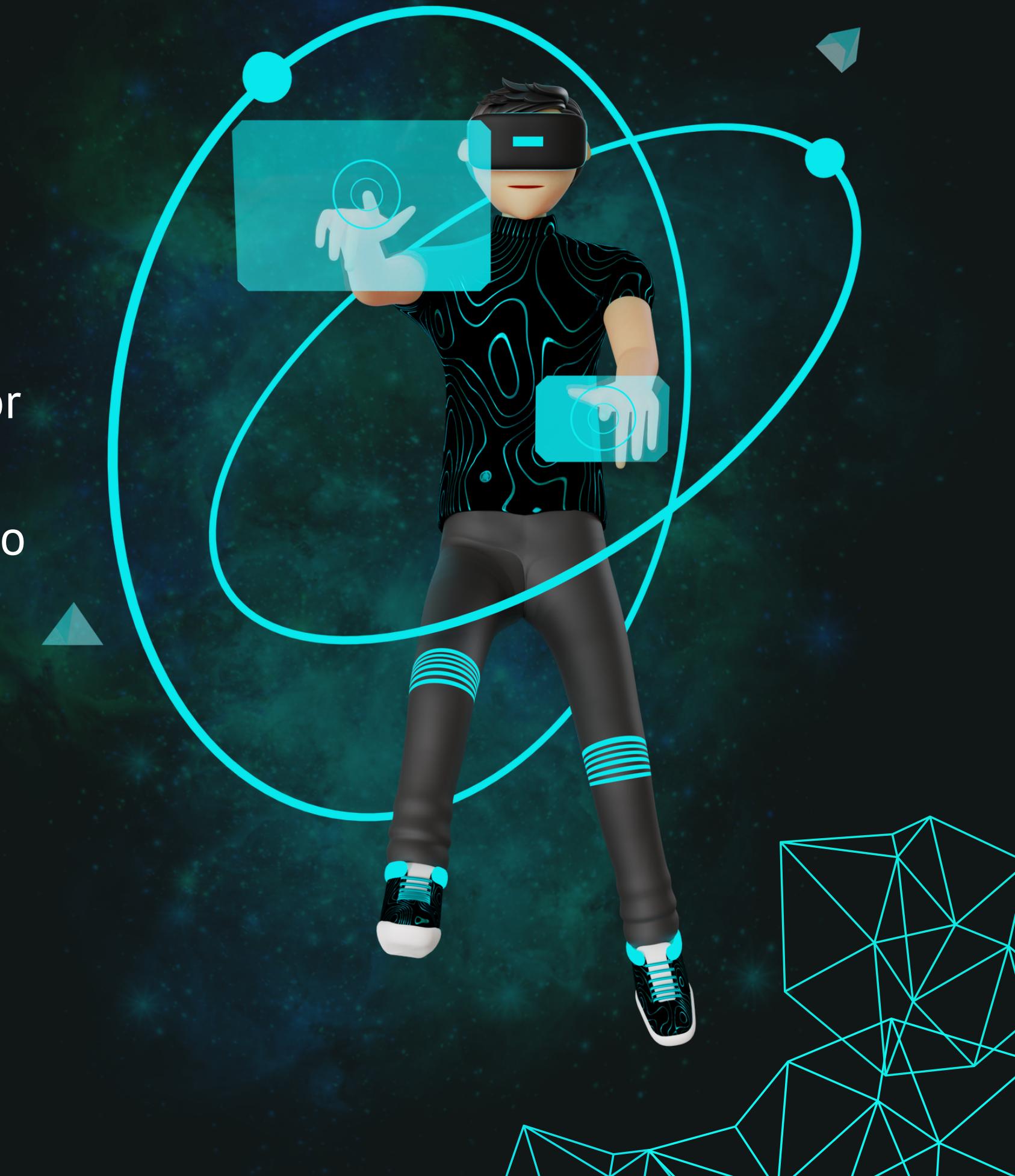
DATA
COMMUNICATION

06

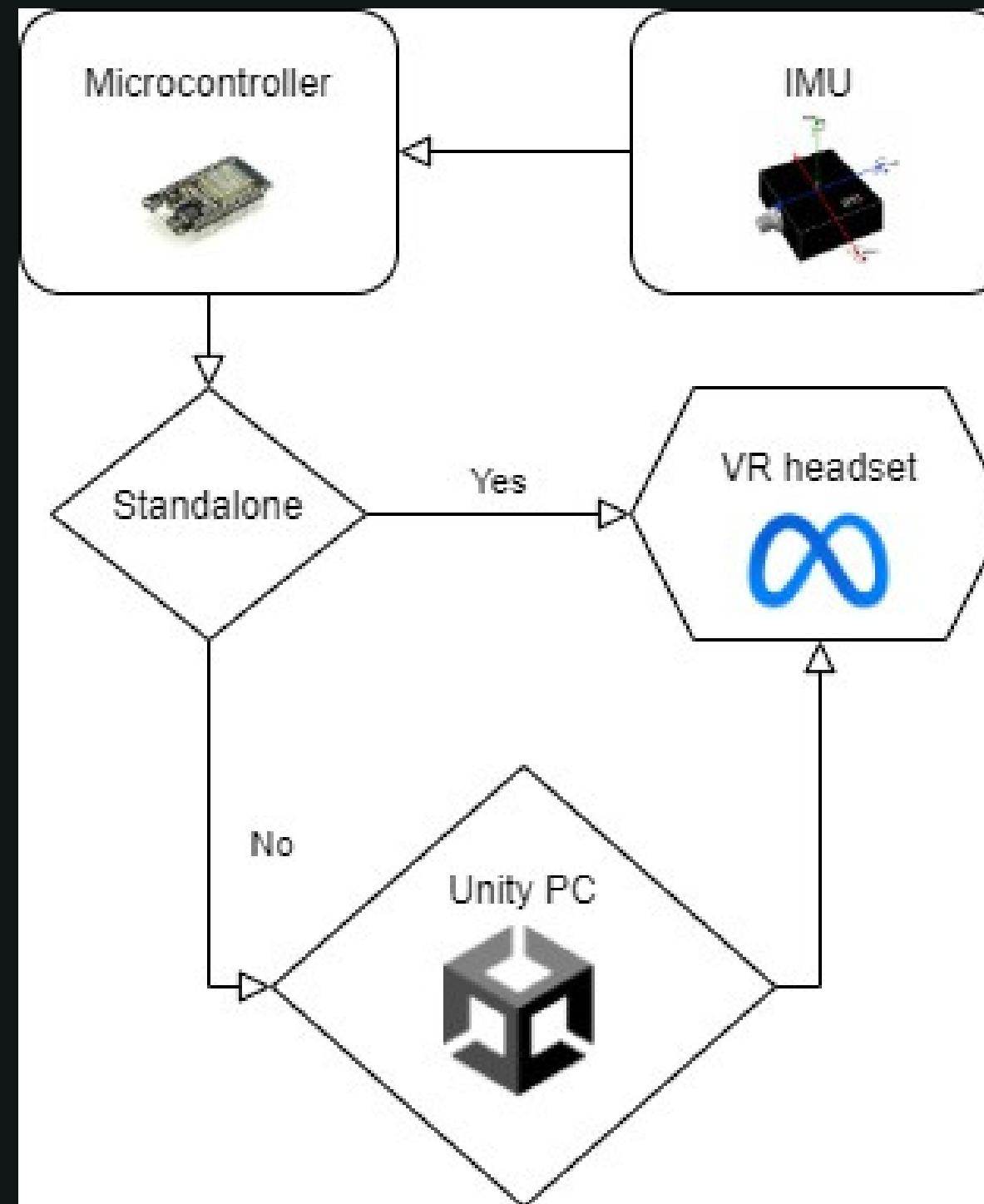
VR INTEGRATION

PROBLEM STATEMENT

- To develop an immersive VR game that utilizes IMU for object tracking and movement control along with providing haptic feedback that adds more immersion to the experience
- This system involves developing software to interpret and process the IMU data, as well as designing and programming the game environment and mechanics.

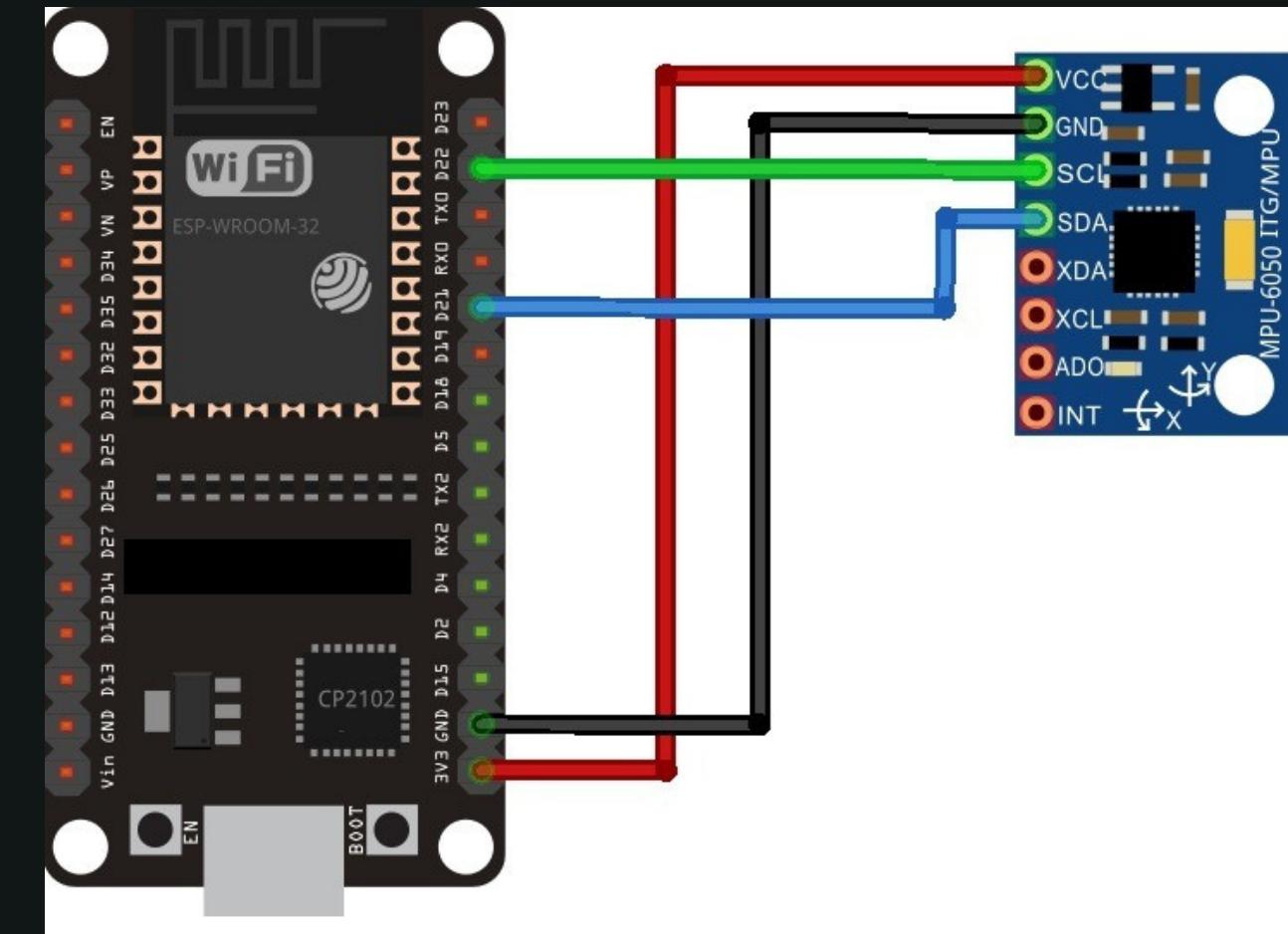


SYSTEM DESCRIPTION

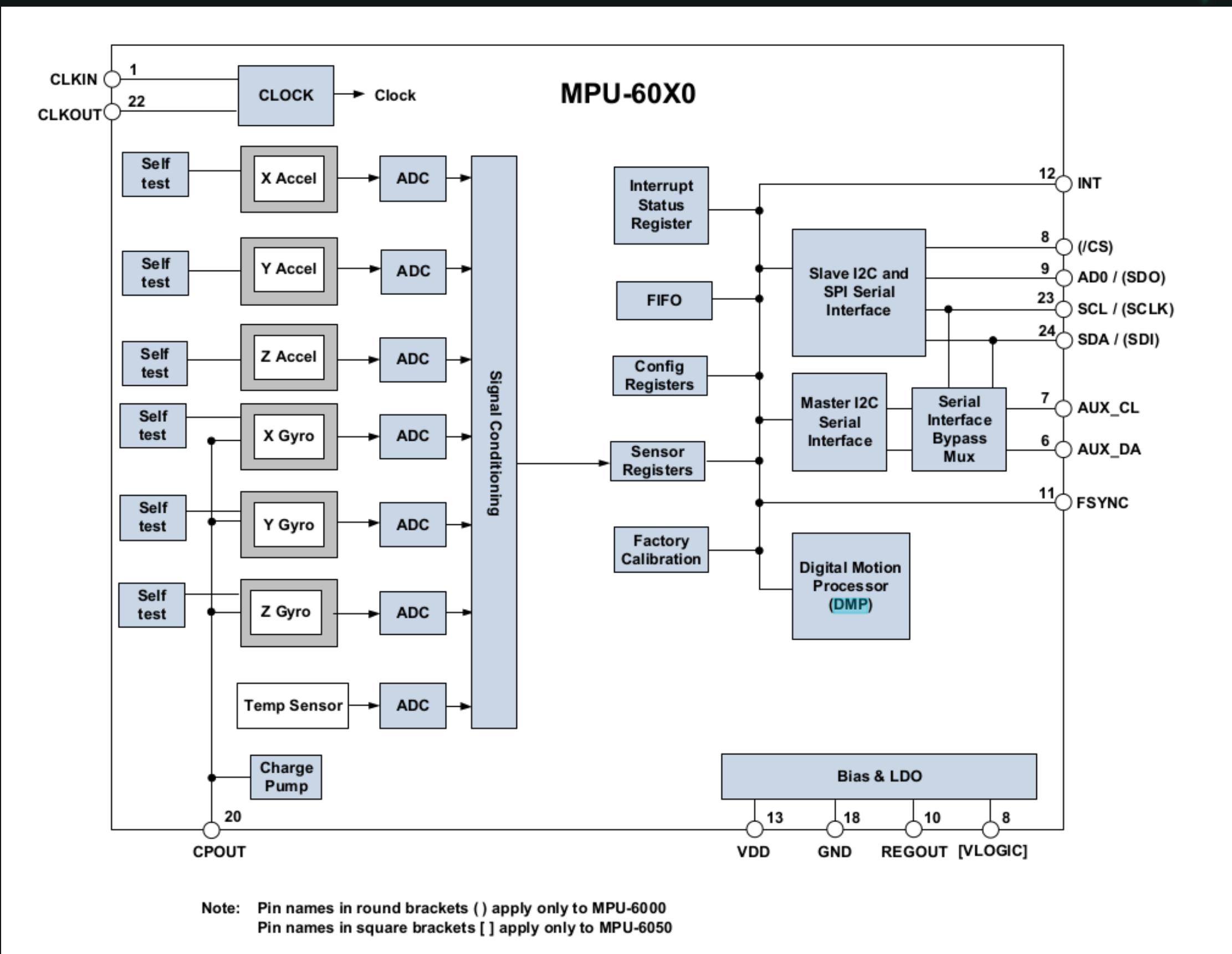


HARDWARE SETUP

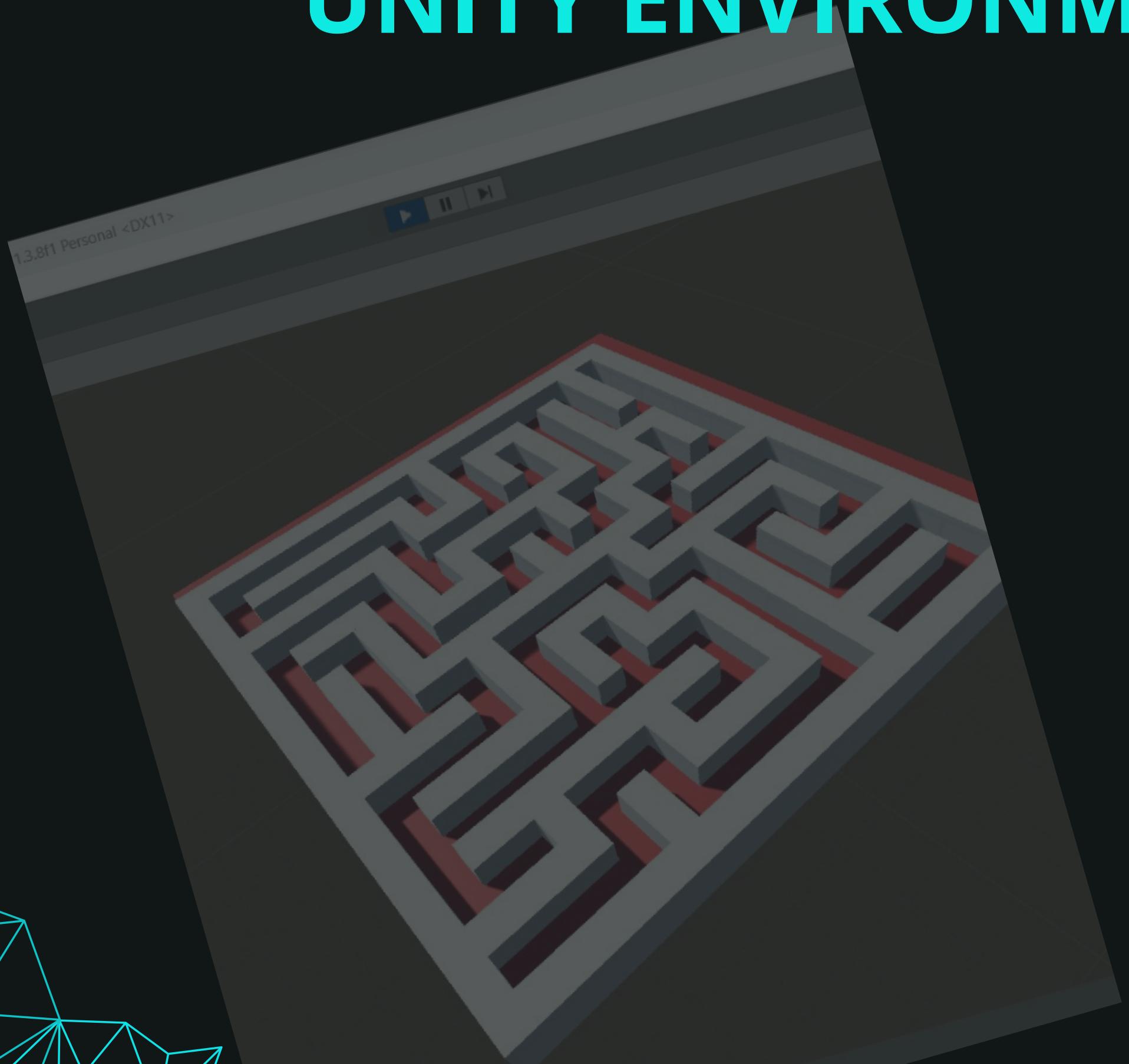
- ESP32
MICROCONTROLLER
- IMU UNIT (MPU6050)
- META QUEST 2
- SOFTWARES:
UNITY, ARDUINO IDE



DATA ACQUISITION: DMP in MPU6050



UNITY ENVIRONMENT SETUP

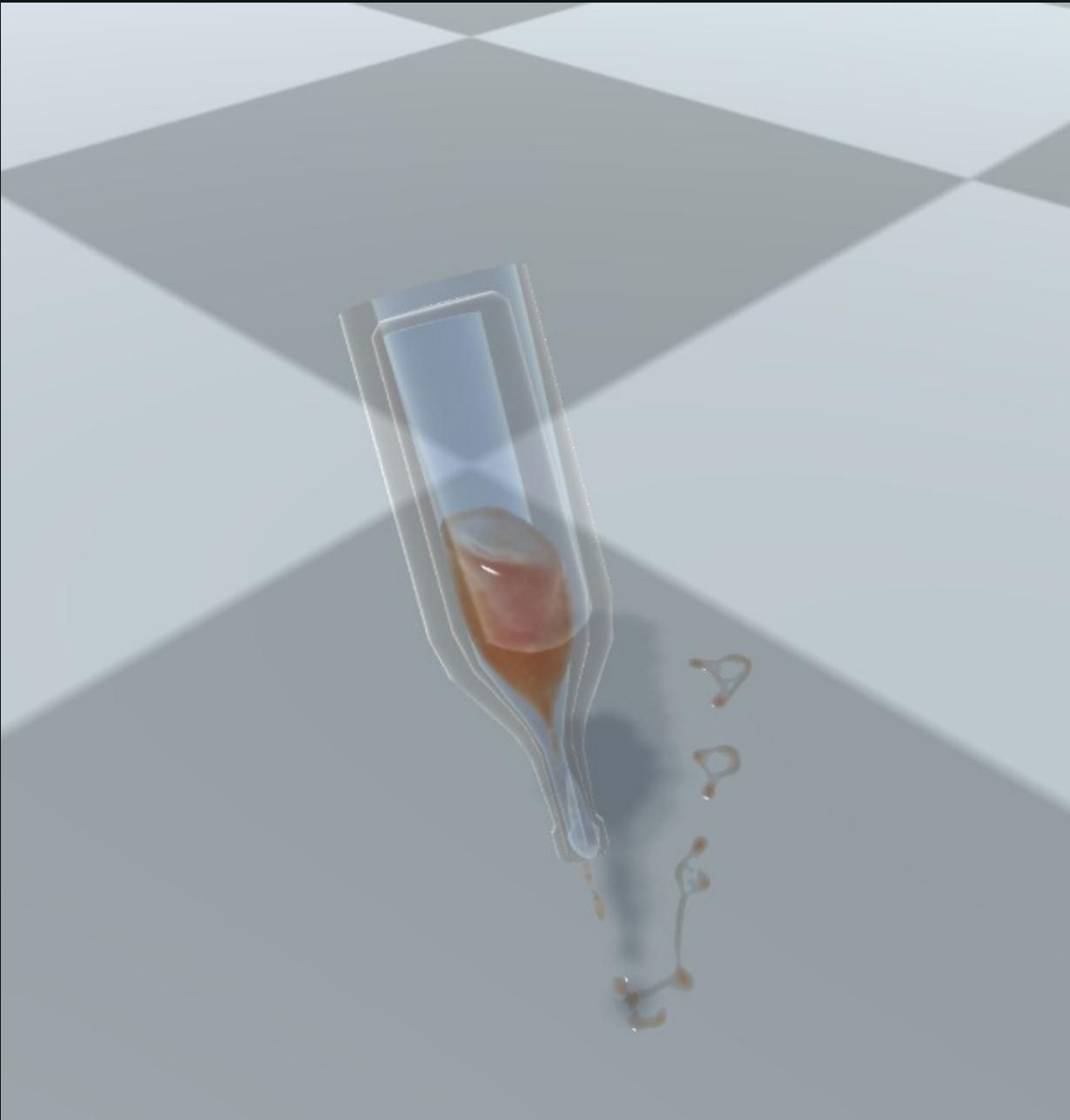


MAZE ENVIRONMENT

This entire maze will move based on the quaternion orientation that you get from the IMU which will be attached to a box-like structure to give the haptic perception

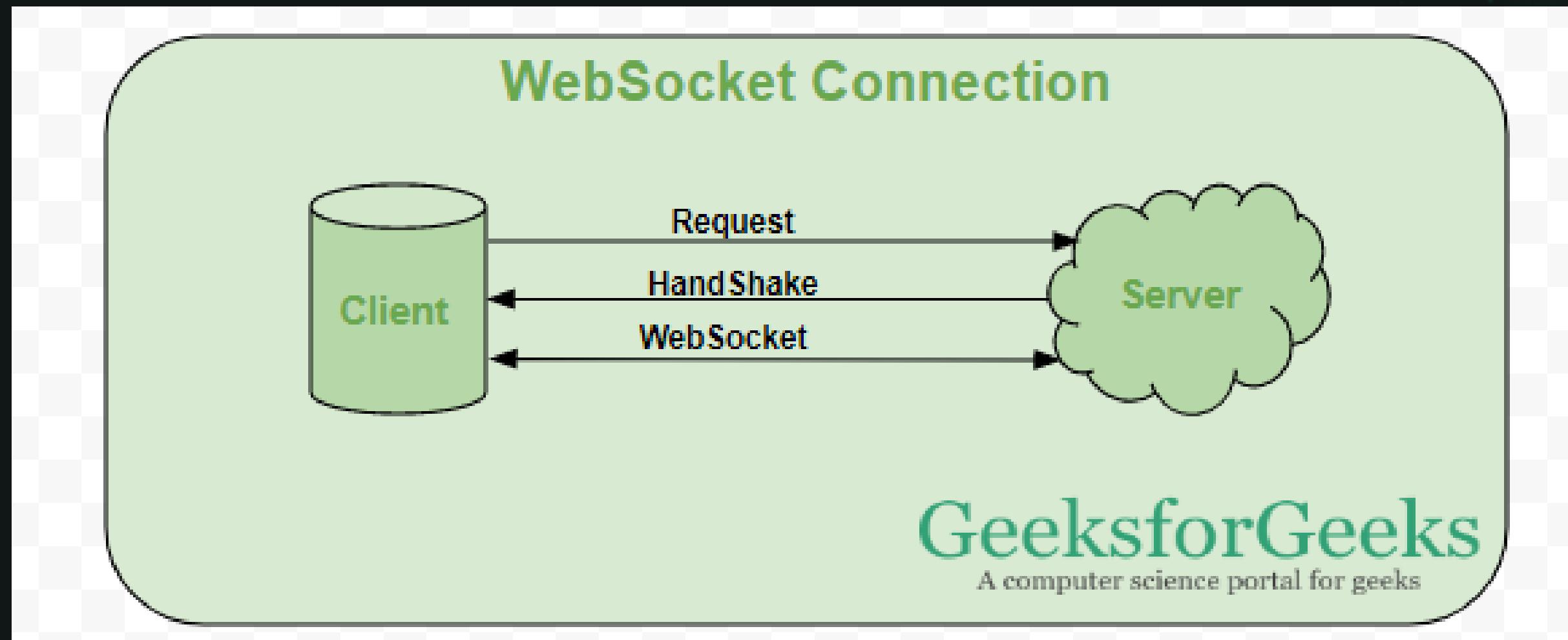
UNITY ENVIRONMENT SETUP

VIRTUAL FLUID VESSEL



The bottle rotates based on the IMU data and fluid pours out of the vessel accordingly

DATA COMMUNICATION

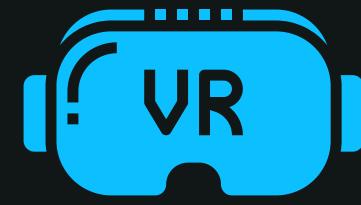


Unity <----> ESP32

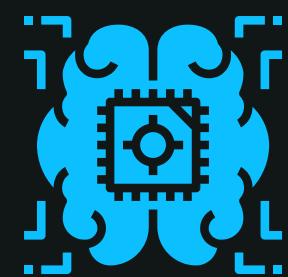
VR INTEGRATION



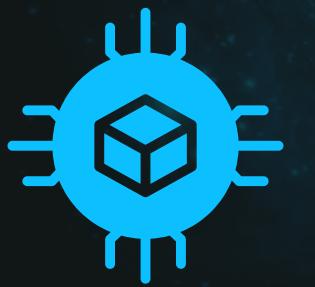
FURTHER AHEAD



FLUID RENDERING



IMPROVED HAPTIC
PERCEPTION



REUSING THE
PIPELINE



EVEN LESSER
LATENCY

THANK YOU

