



Knight Foundation
School of Computing
and Information Sciences

Knight Foundation School of Computing and Information Sciences

Spring 2023 Senior Design Project



Digital Twin Room Emulator and Asset Manager

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PROBLEM

The product owner's goal was to create a digital twin environment which emulates various laboratory rooms. The user would be able to work and perform tasks in each room through VR that emulate the tasks they would need to complete in the real world.

The premise of this goal was to streamline and simplify the work process in various labs. The user would not need to worry about damaging lab equipment or coming in contact with harmful chemicals or tools.

Our team decided to develop the product in Unity because of it's user-friendly UI and ease of use when for VR development projects.

CURRENT SYSTEM

- Player can walk around 3 different lab scenes
- Interactable buttons that change the scene
- Dynamic loading of digital assets
- Sensors that retrieve information about the physical room

REQUIREMENTS

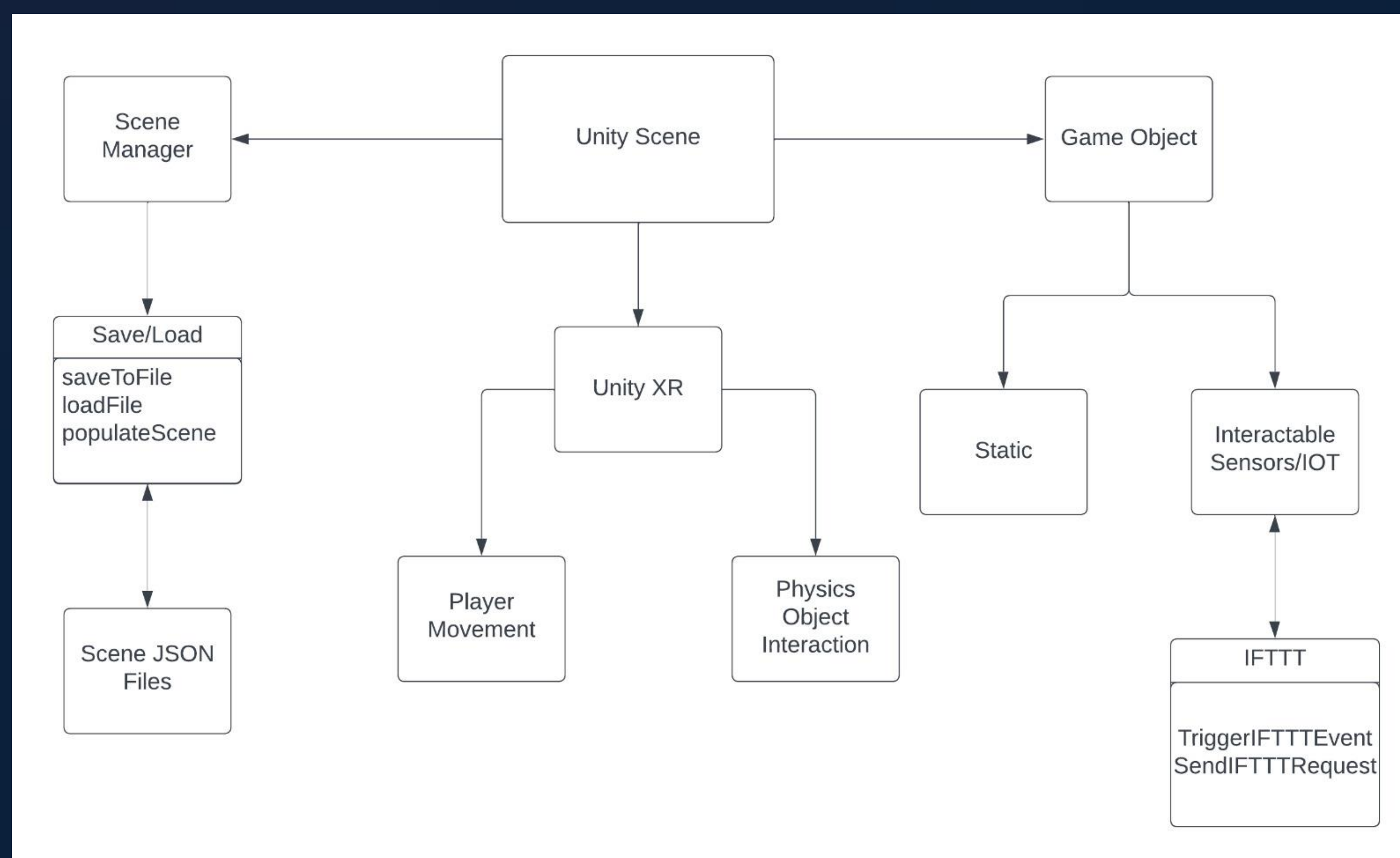
- Unity ver. 2021.3.117f1 or later
- Github
- Meta VR headset
- IFTTT-compatible sensors



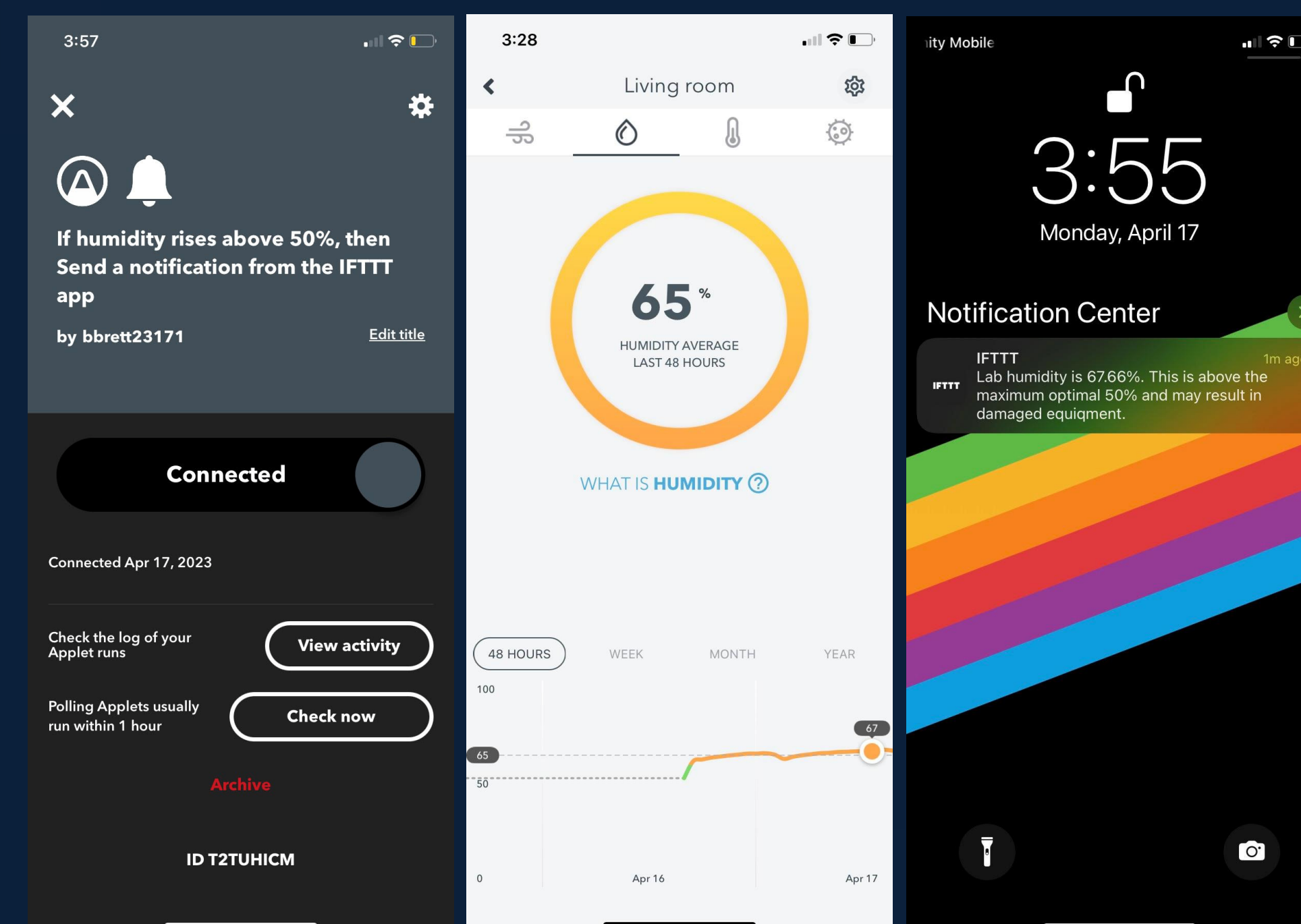
IMPLEMENTATION

- Unity ver. 2021.3.17f1
- C#
- IFTTT
- Github

SYSTEM DESIGN



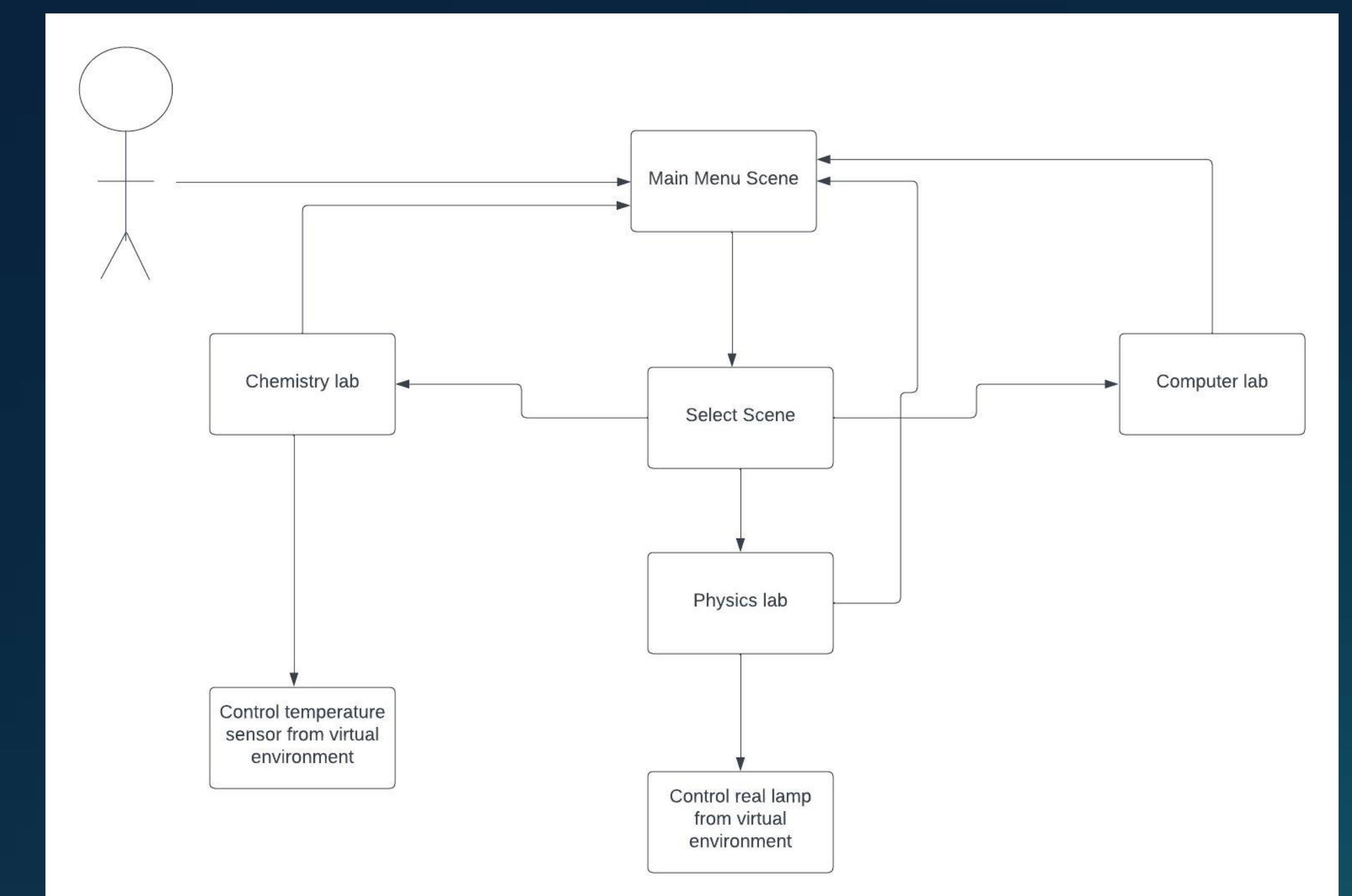
VERIFICATION



SUMMARY

- Our team was able to create a working demo with quick transitions to different scenes. Additionally, we set up several sensors/smart devices to relay information to users about appliances and the environment of the rooms.
- We put an emphasis on integrating various smart devices using IFTTT which allows developers to create custom trigger events.
- Future developers can expect to integrate more devices into the project.

OBJECT DESIGN



Engineering
& Computing

ACKNOWLEDGEMENT

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