

Engineering Education with Extended Reality (XR)

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COLLEGE OF
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SCIENCE, AND ENGINEERING**
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Introduction

- **COVID-era highlights the challenge of remote education**
- **Piloting UAlbany's first XR Lab**
- **Immersive and Experiential Learning**





Agenda

- **Background and Context**
- **Problem Statement**
- **Methodology**
- **Key System Requirements**
- **Logical Design**
- **Physical Design**
- **System Demonstration**
- **Limitations**
- **Future Work**
- **Individual Contributions**
- **Questions**

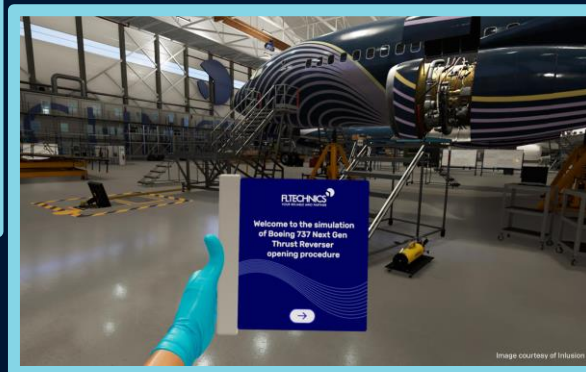
Background and Context

Revolutionary

Evolving landscape of
education and technological
advancements

Applications

Effective in other STEM
fields



Problem Statement



HANDS-ON

Learning through
experiment

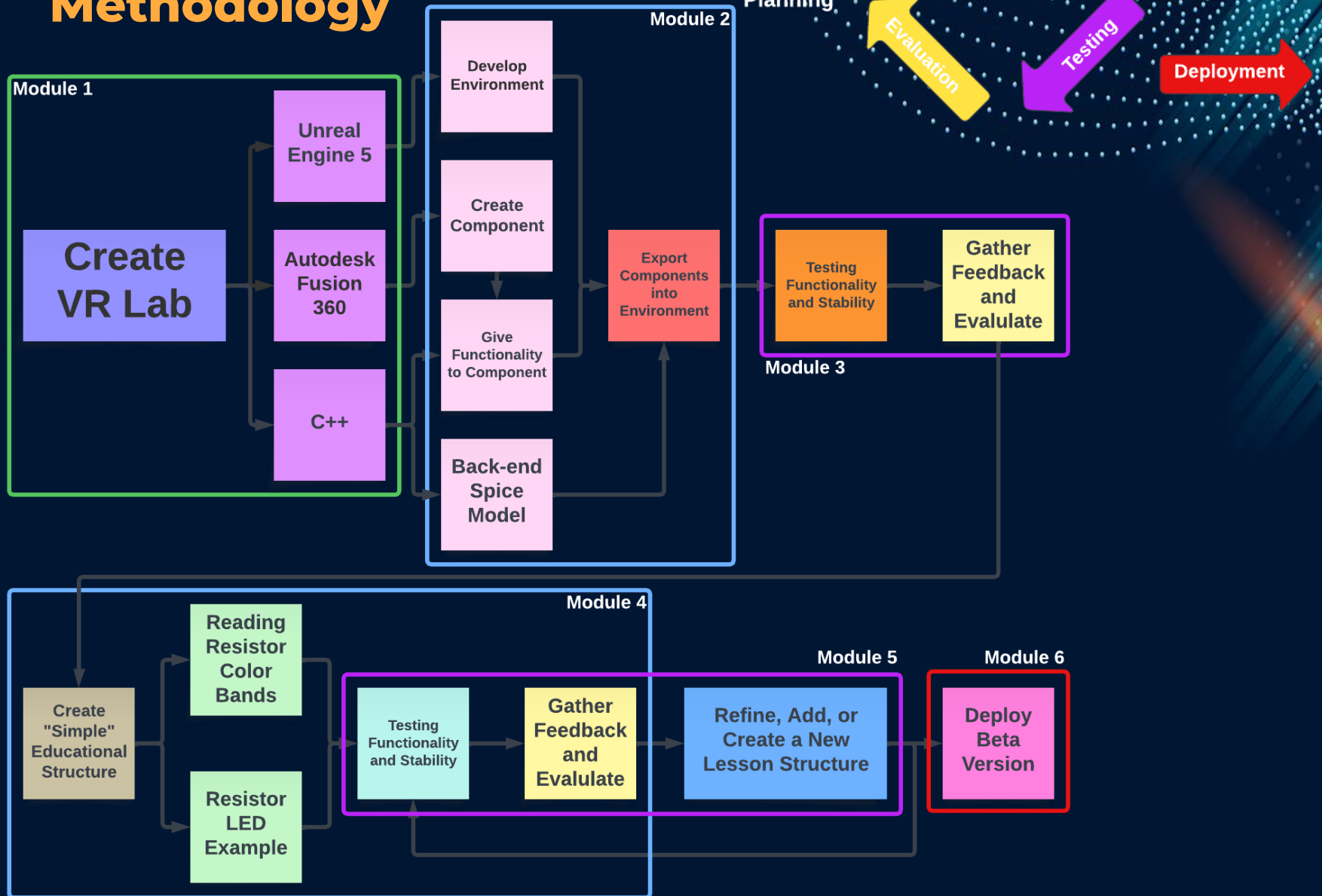


REMOTE LEARNING

Mandatory lab
components



Methodology





01

**Key System
Requirements**

02

Logical Design

03

**Physical
Design**

01 Key System Requirements

Functional Requirements

- User Interactions – Intuitive Controls
- Simulation Mechanics – Object Interactions
- Environment Progression – Lessons
- Optimization/Monitoring – Optimize Assets

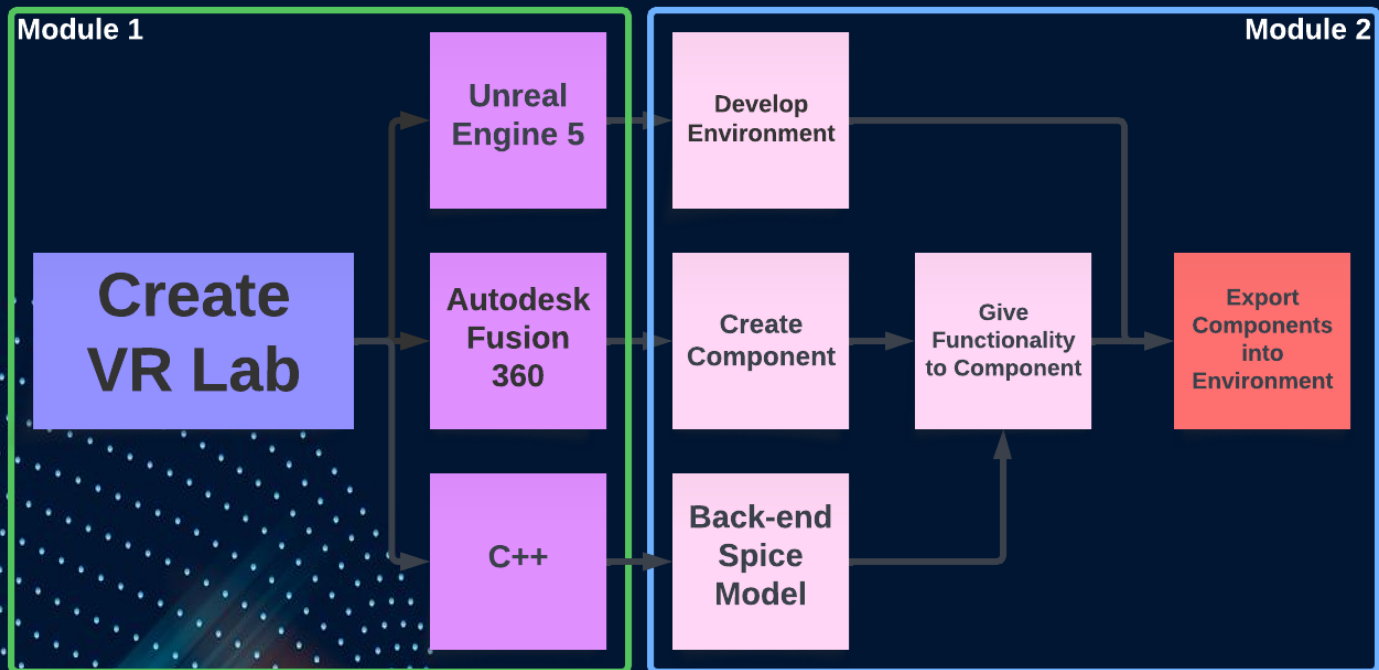
Non-Functional Requirements

- Performance – Convenience
- Compatibility – Hardware and Platforms
- Reliability – Stability



02 Logical Design

Design Concept
Components
Relationships



03 Physical Design



System Components

Meta Quest 2
Unreal Engine 5
Fusion 360



Alternatives

Mixed Reality
AR
Hand Tracking



Justification

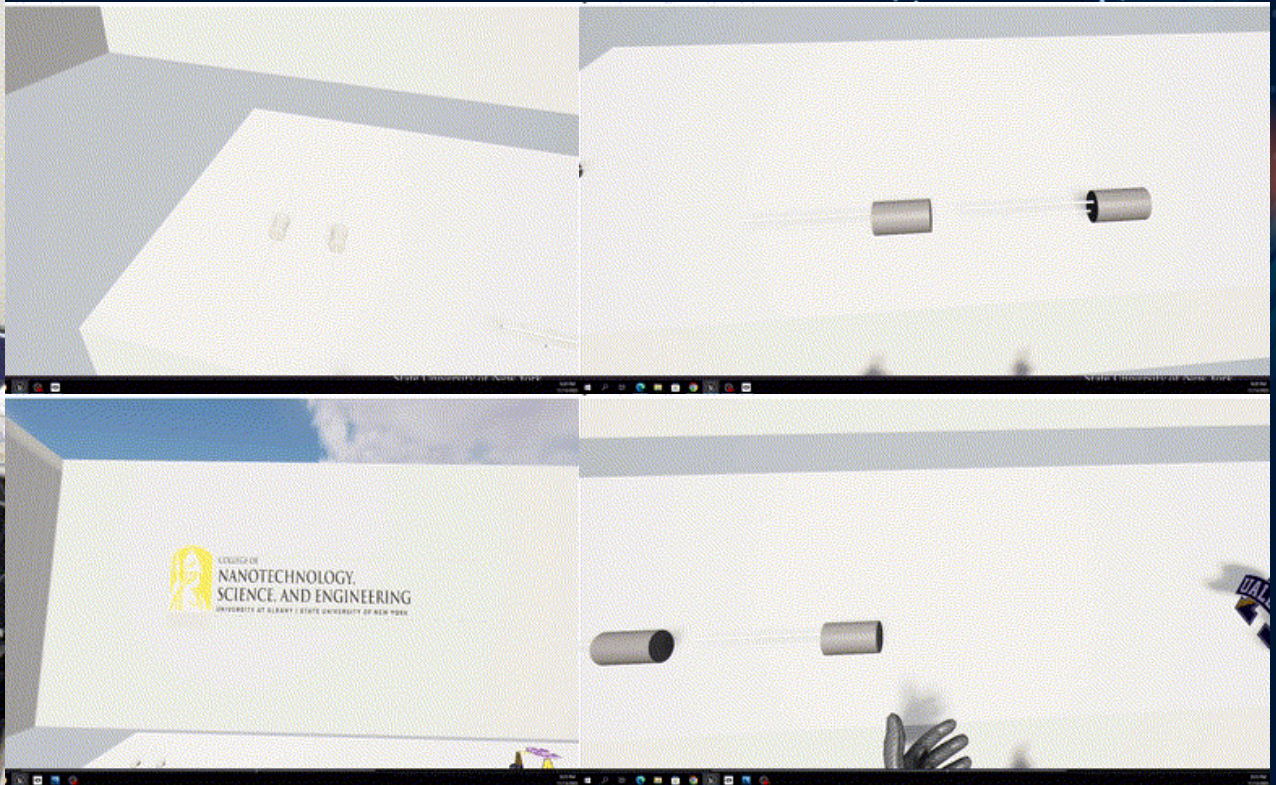
Documentation
Simplistic
Realistic



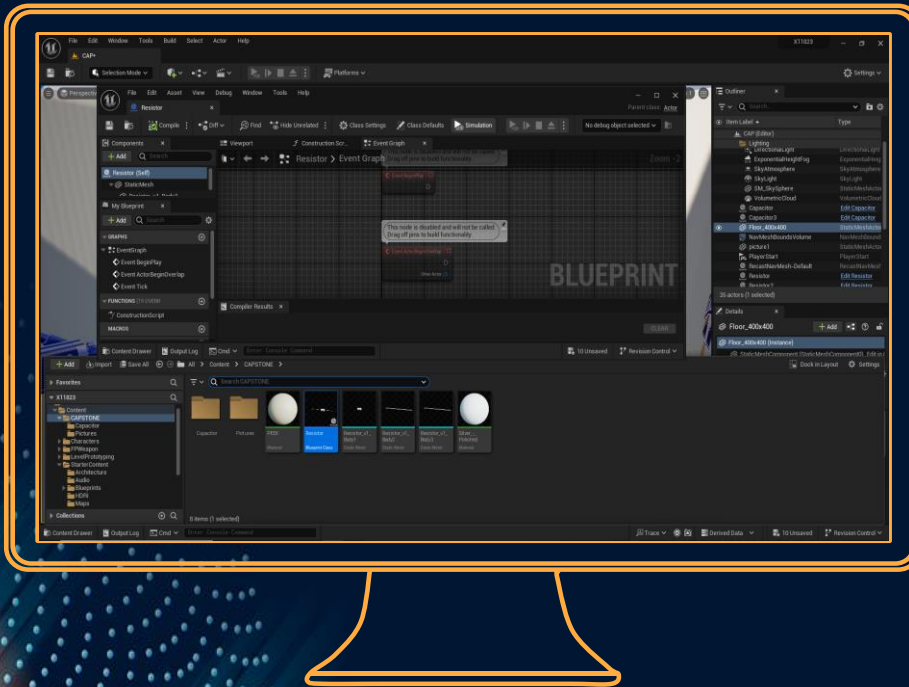
Implementation Plan

Piecewise
Constant Revision
Documentation

System Demonstration



Limitations



Hardware:
Processing Power

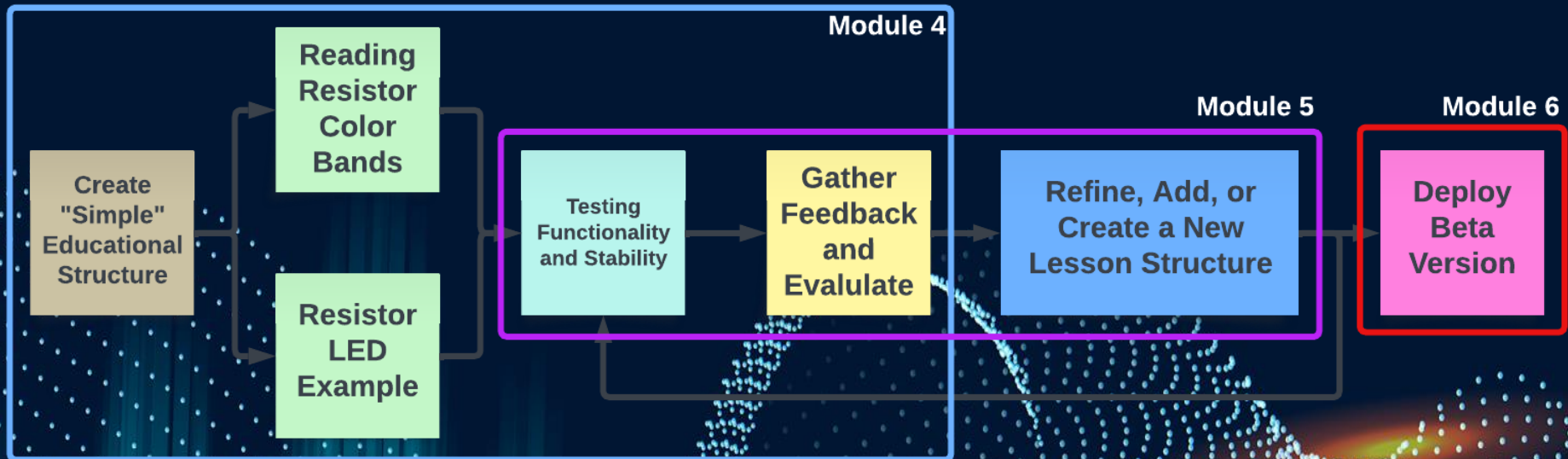
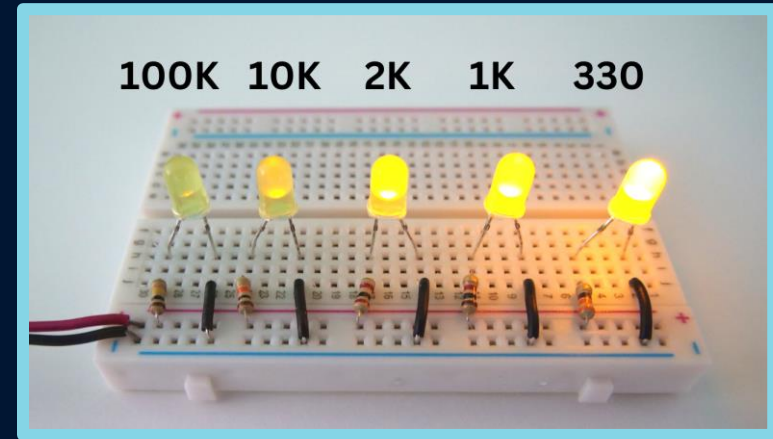
Software:
High Learning Curve

Recommendations for Future Work

Spring Plans

Future Work

- More Structural Lessons
- Deploy Beta



Individual Contributions

Joren Cruz

- **Support Roles:** Archivist, Scheduler
- **Most Significant Contribution:** GitHub Repository, Documentation, Unreal Research

Diego Tapia

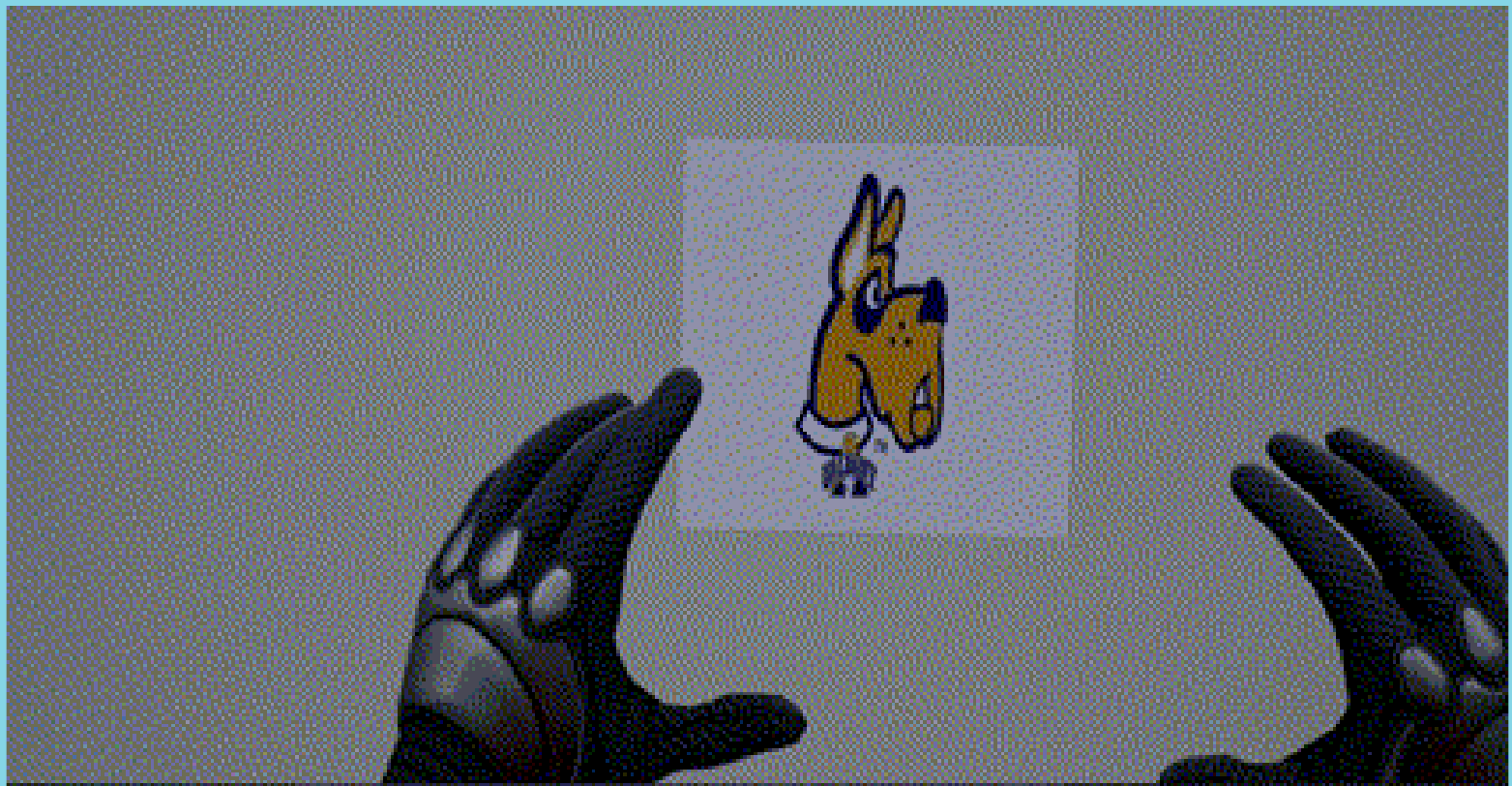
- **Support Roles:** Point of Contact
- **Most Significant Contribution:** Documentation, Skeleton Assets

Daniel Wang

- **Support Roles:** Editor, Treasurer
- **Most Significant Contribution:** Environment Development, GitHub Repository, Diagrams, and Documentation



Thank You!



Questions?

