Extended Reality: VR Lab for Enhanced Learning – Engineering Design Review

Stakeholder: Prof. Aveek Dutta, Department of Electrical & Computer Engineering

Capstone Team Members: Joren Cruz, Diego Tapia, Daniel Wang

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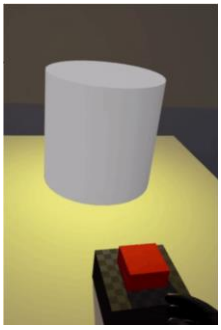
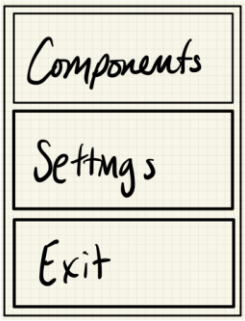
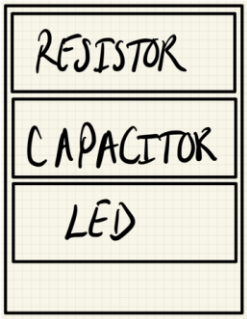
Iterative Design Process Stage: Analysis & Design, Implementation

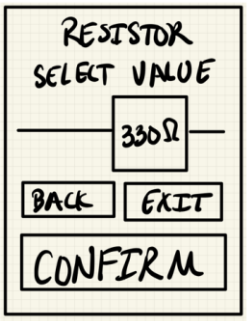
Agenda

- **QoL Improvements**
  - Projects have been moved to GitHub for ease of access
  - Device inputs expanded to support other VR hardware
- **Blueprint Visual Scripting (BPs)**
  - User Interface Menus
  - User and Object Interaction
    - Fluid Movement, Hand Collision, Object Interaction, Action-Based Function
- **Spice Application/Implementation**
  - NGSpice Netlist
  - LTSpice Netlist
  - Data Export and Import
- **Application Interconnection**







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* RC Circuit Transient Response

*resistor connected between node 1 & 2
R1 1 2 1k

*capacitor connected between nodes 2 & 0
C1 2 0 1u

*piecewise linear input voltage
vin 1 0 pwl (0 0 10ms 0 11ms 5v  20ms 5v)

*transient analysis for 20ms, step size 0.02ms
.tran 0.02ms 20ms

*define run-time control functions
.control
run

*plotting I/O voltages
plot v(1) v(2)

write output.csv V(1)
.endc
.end
```

Individual Contributions

Diego Tapia - Point of Contact

- Implemented hand to object collision.
- Created a functional button.
- Implemented Actor to Actor interactions.

Joren Cruz – Archivist, Scheduler

- SPICE application using NGSpice and LTSpice simulation.
- Netlist for simple circuit designs
- Data export and import

Daniel Wang – Editor, Treasurer

- Migrated UE5 Projects to GitHub
- Drafted, Designing, and Implementation of UI Menus
- Blueprint Research