

# VR Chess - Easily Accessible Virtual Reality Multiplayer Chess Experience

Presentation Video ID# 31149

Fall 2022 HIPs Student Symposium

## VR-Chess Team Members

Team Member	Role
Eric Smrkovsky	Project Manager
Christian Leon	Back End Developer
Brett Harris	Graphics Design and Visuals
Jose Fernando Jimenez Chavez	Lead Technical Designer
Jacob Miller	Front End Developer



CSCI: 150

Introduction to Software Engineering

## United Nations Sustainable Development Goal(s):



Good Health and Well-being - Goal 3. Ensure healthy lives and promote well-being for all at all ages

**FRESNO STATE**  
Computer Science

# VR-CHESS

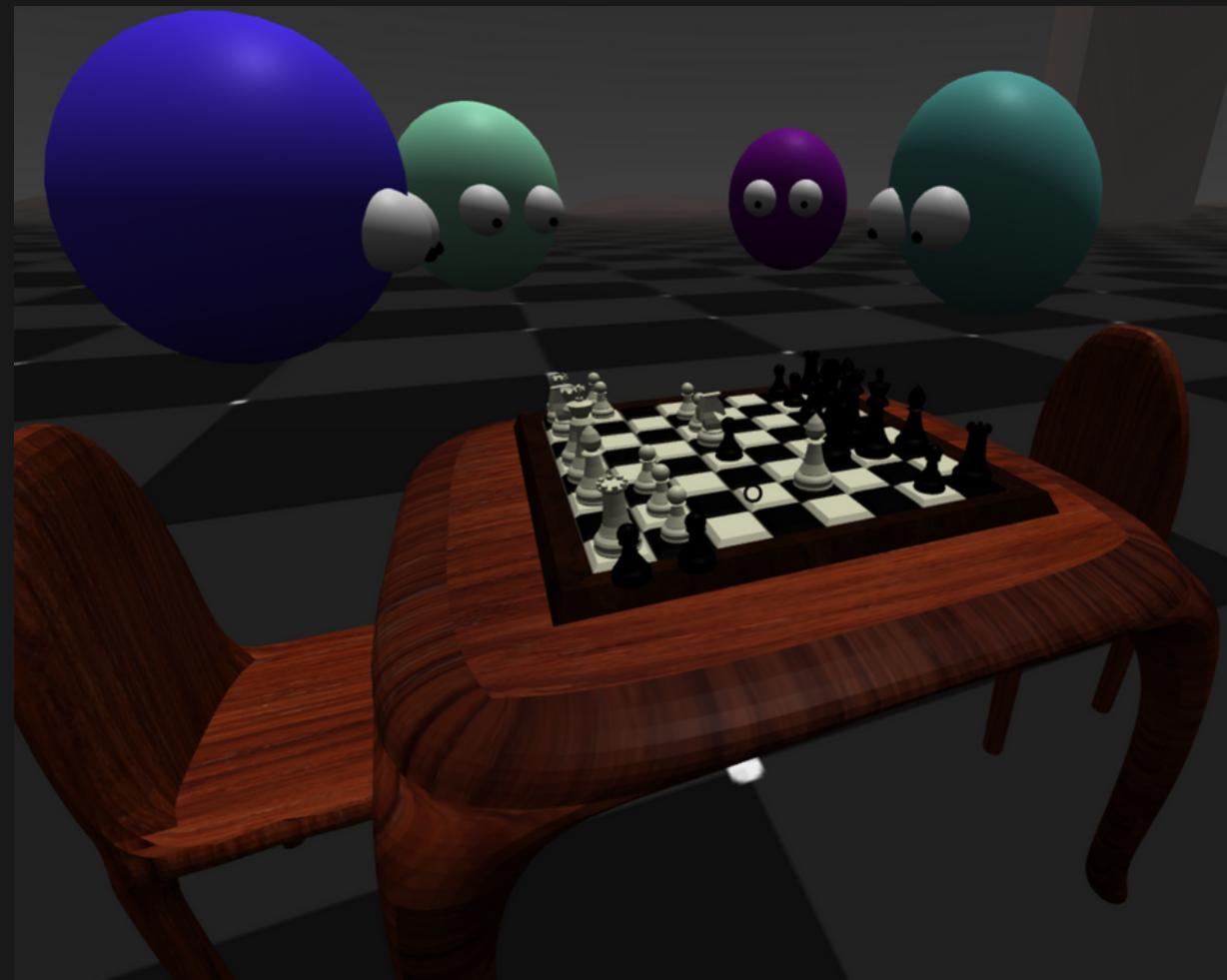
## Introduction

VR-Chess is a new self-contained product that utilizes the web browser on phones, tablets, computers, and headsets to play a game of chess over the internet in semi-immersive virtual reality. This game provides a simulated 3D environment using 3D graphics to give online chess play a realistic, immersive feel. The VR-Chess interface is simple and accessible by a wide range of devices, so players of all skill ranges can play. VR-Chess is web-based and works directly in a web browser to provide access to people who don't have access to VR-Headsets. VR-Chess is strictly for two players, providing a virtual space for players to practice their chess skills with others online.

# VR-CHESS

## The Value of VR-Chess

- Relaxation/Mental Health/Well-Being
- Ability to Connect with Friends
- Practice Chess Skills in VR
- Available Cross-Platform
- Simplified Access



# Project Management

Eric Smrkovsky

- Documentation
- Project Board
- Presentations
- Evaluating Requirements
- UML Design
- Project Idea
- Project Planning

## Main Features

3d Graphics

Multiple Environments

Multiple Piece Designs

Spectator Mode

Dynamic Room Loading

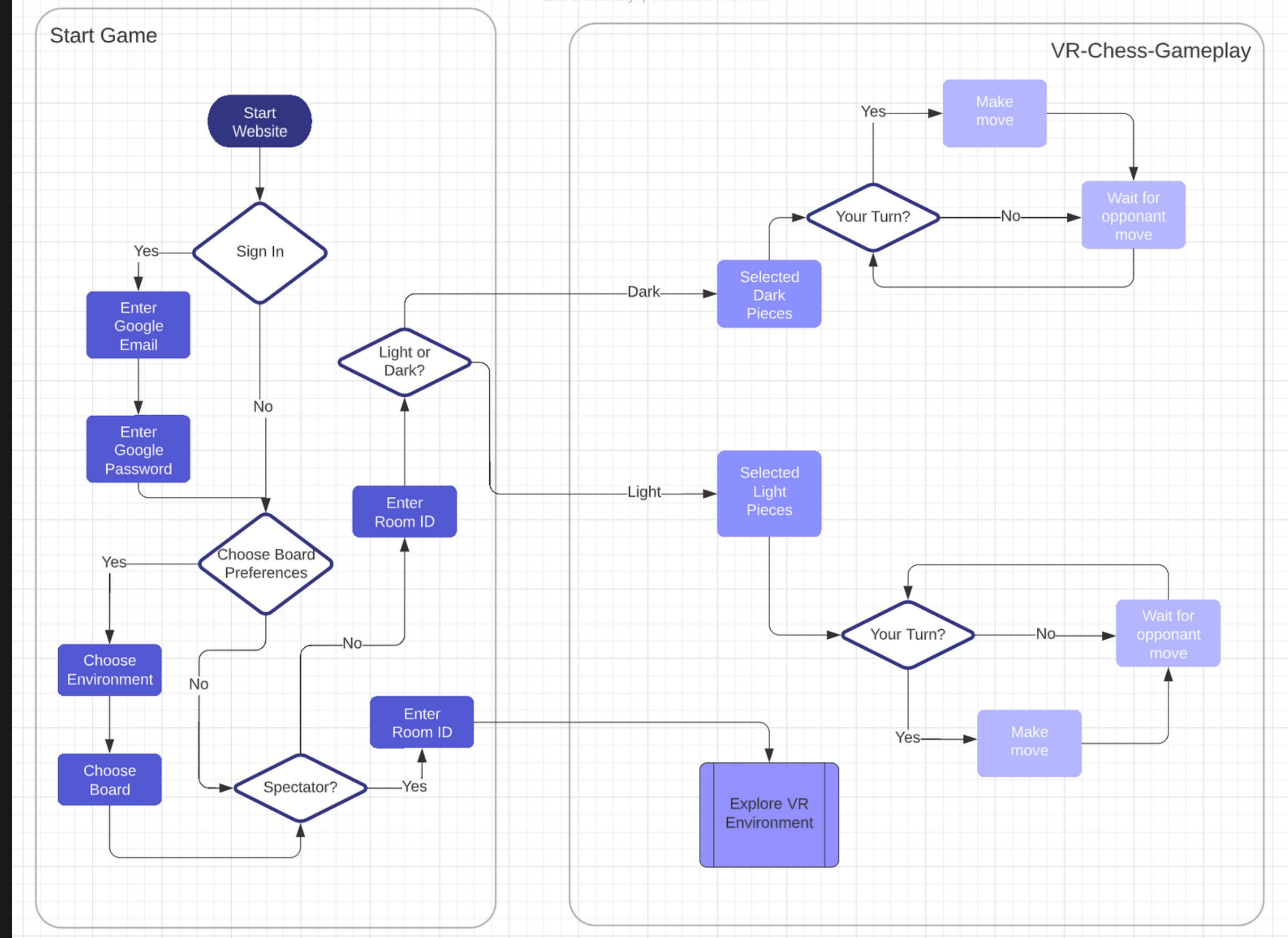
Turn Based Game Logic

Online Networking

Google Authentication

# User Journey Flowchart

Eric Smrkovsky | November 30, 2022



# Graphics and Visuals

Brett Harris

- Developed models with Blender
- Used A-Frame Environment Component and custom lighting for backgrounds
- Set movement dynamics with Three.js
- Developed custom dynamic scene loading components for A-Frame

Challenges:

- Ran into limitations with each framework
- 10% of time modeling setting up pretty scenes, 90% of time programming and debugging the implementation
- Learning Blender, Three, A-Frame, and JS on the fly

Colors:

Basic  
Ashes  
Red vs Blu  
Gold and Silver  
Sunset  
Hot and Cold  
Mint  
Random  
Super Random

Scenes:

Woods  
Checkerboard  
Waves  
Volcano

Room Code: f49f

Submit

Log In with Google



# Movement & Gameplay

Jacob Miller

## Repo Component

- Player turns
- Player position
- Spectator mode

## Chess-Piece Component

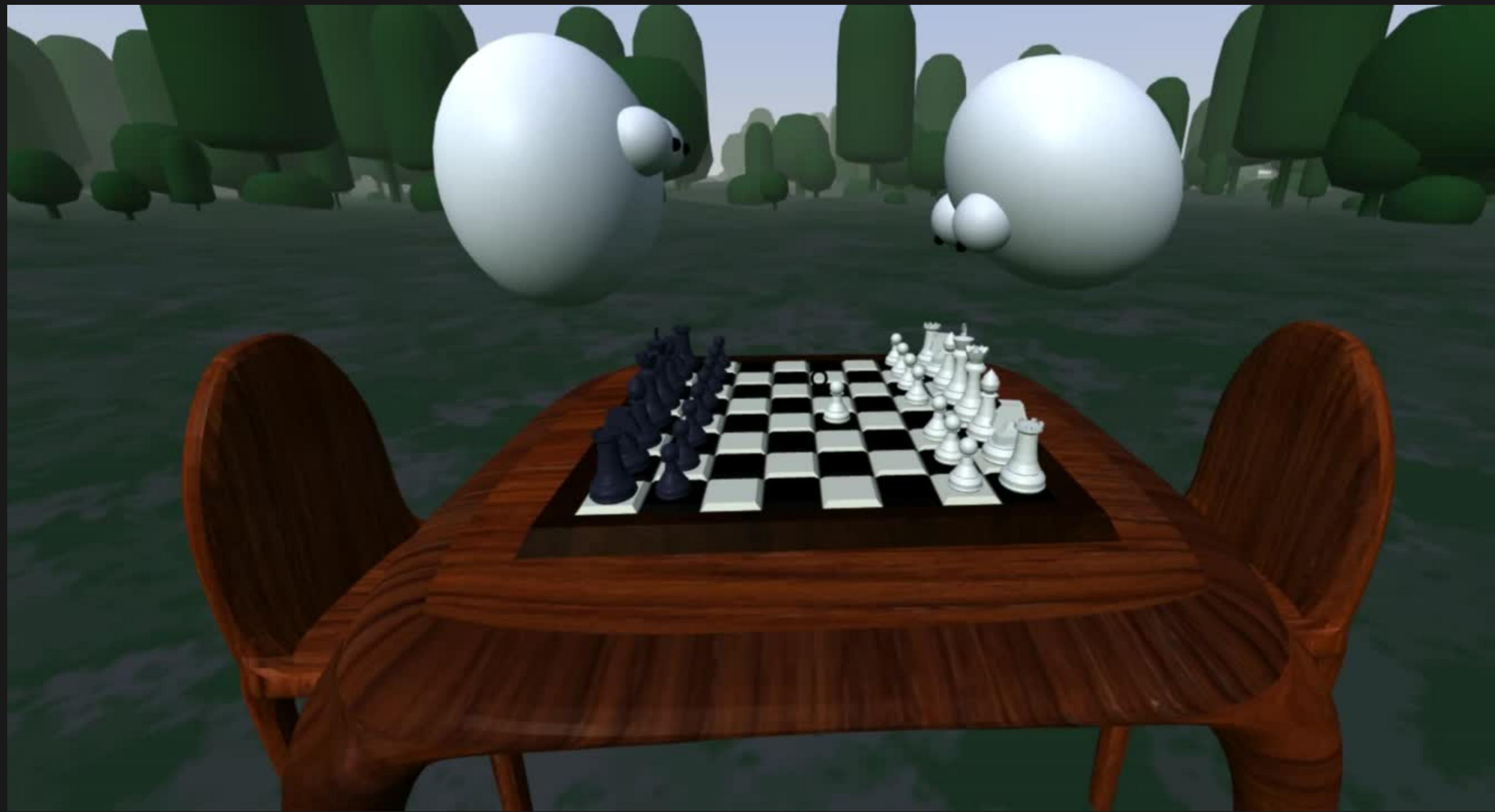
- Board position
- Special moves

## Piece-Interaction Component

- General movement
- Move validation
- Capture & Graveyard

## Challenges:

- Learning JavaScript's DOM & Event-Listeners along with AFrame's Entity-Component System
- Constantly debugging a project that grew increasingly larger & interdependent



# Lead Technical Designer

Jose Jimenez

- Set up Networked A-Frame project and integrated existing code to create multiplayer experience, hosted on Heroku. Also added Google OAuth login. Minor A-frame scene work
- Lead team/team management to complete core gameplay functionality first
  - Used NAF as it was easy to integrate into existing codebase
  - Used Heroku as it was the quickest to deploy an instance, and also make automatic deployments from github a breeze, we were actually able to fix a small issue during milestone 2 during someones presentation, would not have been as easy without CD tools
  - Added Google OAuth for optional logins.
- Problems?
  - Was lead to believe Glitch would be a great option, it's not for anything more than a minor 1 page/a-frame scene project. Very quickly outgrew it.
  - Very strange networked template issue.
  - Felt as if we were "boxed in" to node.js and made trying to add on a simpler PHP log in system a little more difficult.

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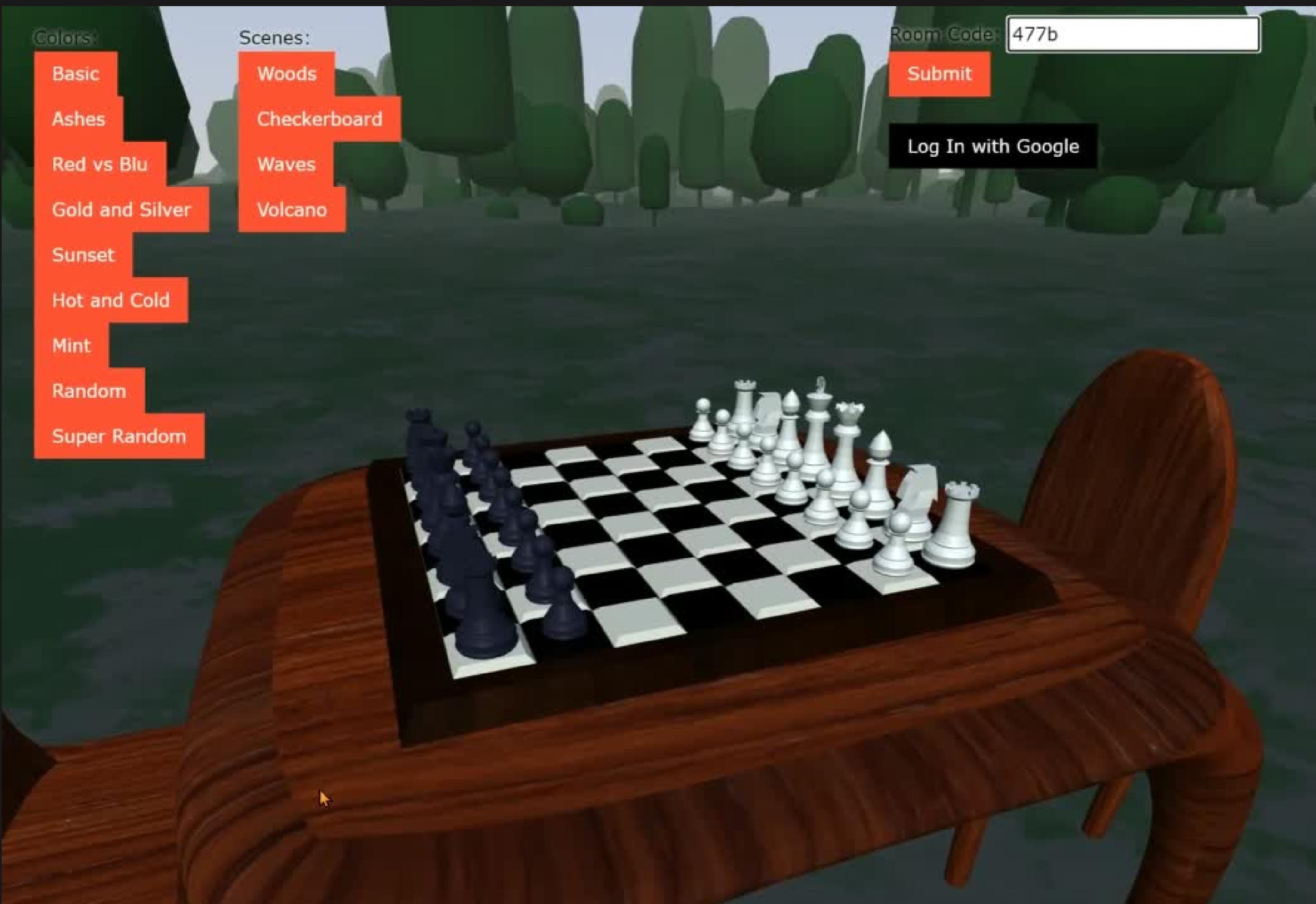
Scenes:

Woods  
Checkerboard  
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Volcano

Room Code: 477b

Submit

Log In with Google



# Database

Christian Leon

- Completed connecting MongoDB database and login.
- Could be used in the future to continue development by storing user data and preferences.

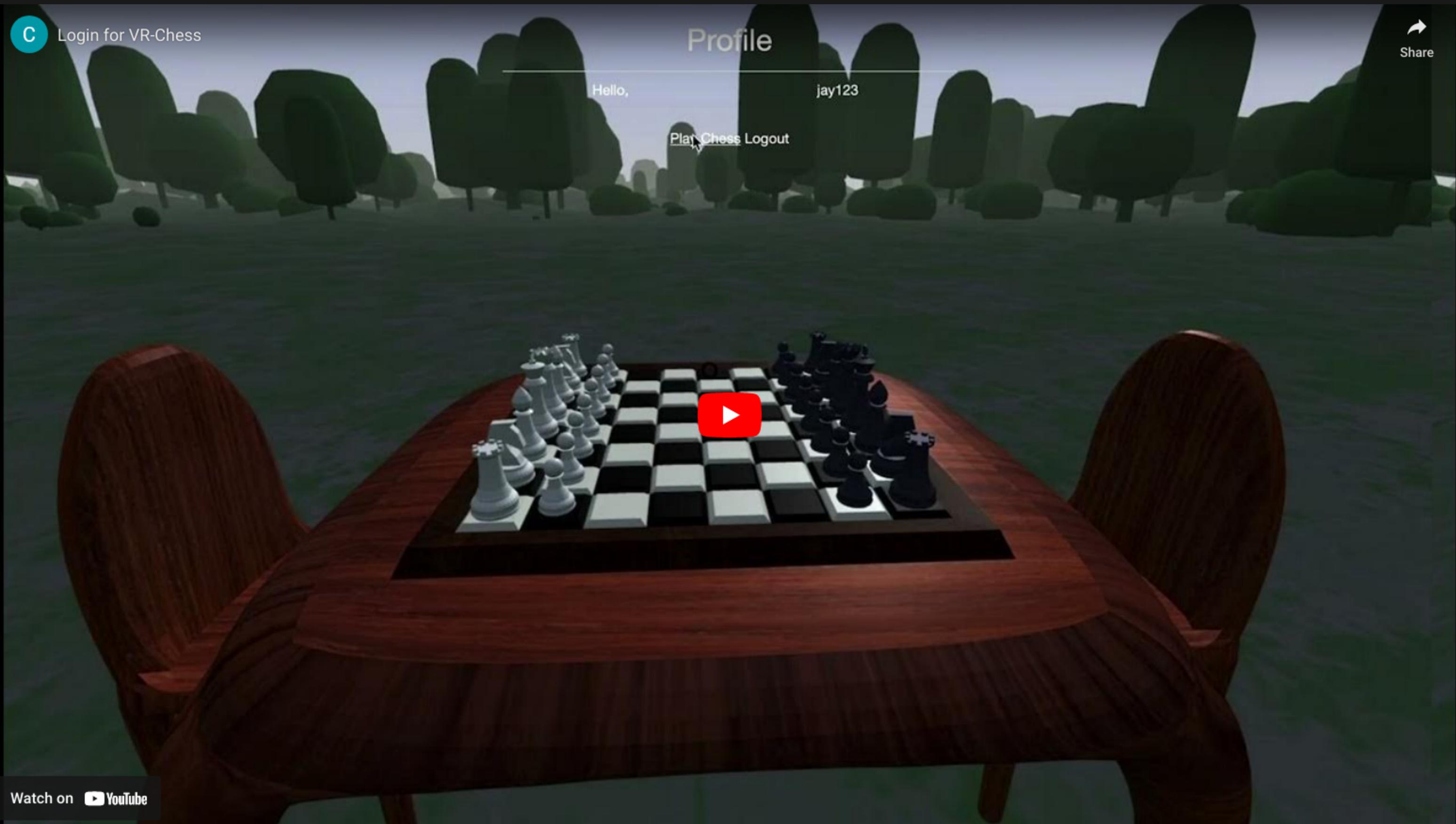
Challenges:

- Implementing two different DB's because of incompatibility. (mysql+php)(mongoDB+js)
- Fusing our gameplay server with our DB server so that it has functionality of both.
- Reconfiguring our server to handle both .html and .ejs files located in separate folders.

SEARCH RESULTS: 1-2 OF 2

```
_id: ObjectId('638761d9e5eba43ade403469')
unique_id: 1
email: "chris@gmail.com"
username: "chris"
password: "test"
passwordConf: "test"
__v: 0
```

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_id: ObjectId('63876827aa40f800165b54a5')
unique_id: 2
email: "josh@gmail.com"
username: "josh"
password: "test"
passwordConf: "test"
__v: 0
```





THANK YOU!  
PLEASE TRY  
PROOF OF  
CONCEPT!

Google "vr chess csci 150"

Click:

<https://github.com/Ericsmrk/VR-Chess> ::

[Ericsmrk/VR-Chess: Term project for CSCI 150 ... - GitHub](https://github.com/Ericsmrk/VR-Chess) ✓

Then click ->



click photo to play with prototype

!!!VR CHESS!!!