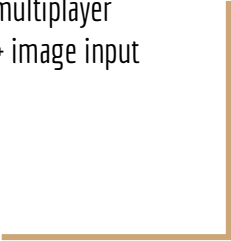




# Doodle Dash

(Extremely unfinished) prototype for a multiplayer drawing game which utilizes Gemini text + image input



# Problem statement

## → **AI and Creativity**

- ◆ Multiplayer games often miss out on utilizing new AI technology for creative purposes like drawing and guessing.

## → **Social Engagement**

- ◆ There is a need for platforms that combine AI, art, and play in a fun social setting.

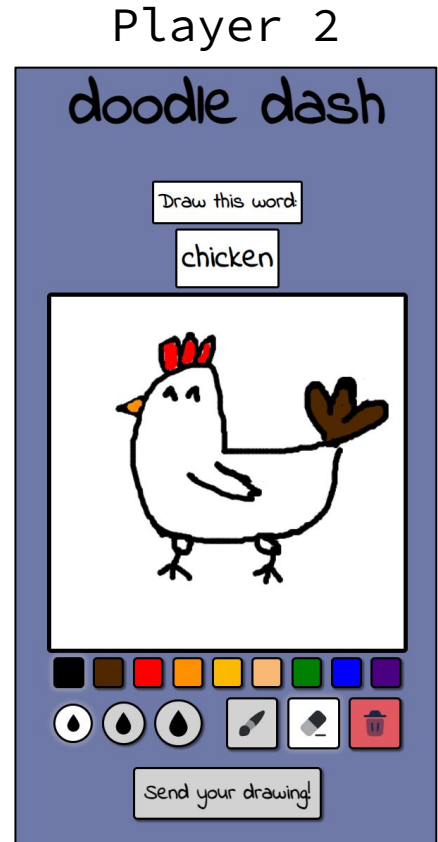
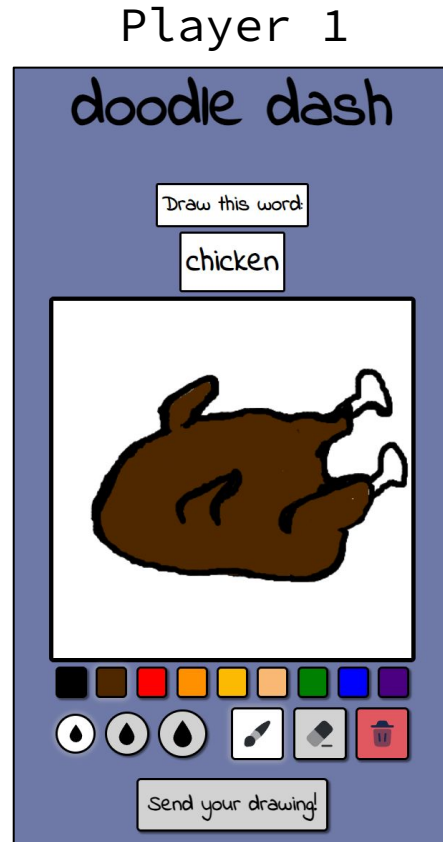
# Solution Overview

## → Gemini LLM Integration

- ◆ Utilizes image + text for creative AI interaction

## → Multiplayer Drawing Game

- ◆ Players draw based on a given word
- ◆ The AI attempts to guess what each player drew, enhancing engagement and creativity



# Technical Details

## → **Front end**

- ◆ Canvas API, p5.js for drawing functionality
- ◆ Socket.IO to handle realtime, two-way communication between client and server

## → **Back end**

- ◆ Python to manage the game logic and finite states
- ◆ Gemini API to utilize LLM multi-modal inputs
- ◆ Flask + Socket.IO to handle game state transitions across all clients
- ◆ TruLens-Eval to assign confidence score to drawn images

# Game States

## → **Initial State - Waiting for Players**

- ◆ When a game room is created, it enters the "Waiting for Players" state

## → **Waiting for Start**

- ◆ The game awaits the leader to start the game

## → **In Progress**

- ◆ Server selects a random word from the word bank
- ◆ Players draw and submit their canvases, and Gemini attempts to guess the drawings

## → **Finished**

- ◆ Enters the "Finished" state when the AI successfully guesses a drawing

## → **Abandoned**

- ◆ If a player disconnects or if certain conditions are not met, the game can transition to the "Abandoned" state

# Future Improvement

## → **Implement Human Feedback Loop**

- ◆ Mechanism to improve AI guesses based on player responses and interactions
  - Thumbs Up and Thumbs Down buttons to allow human feedback on AI guesses

## → **Build Out the User Interface**

- ◆ Improve the game's UI/UX for a more intuitive and visually appealing experience

## → **Improve Usage of AI/LLM's**

- ◆ Utilize new multi-modal capabilities of Gemini as they are released, such as image and video outputs

# Challenges and Learnings

## → **Gemini API**

- ◆ Integrating the recently released Gemini API alongside TruLens-Eval presented difficulties due to being new technology without mature documentation
- ◆ API responded slowly (or not at all), possibly due to high usage

## → **Multiplayer environment**

- ◆ Required synchronization across client sessions
- ◆ Learned the importance of state management and strategies for managing game states effectively