

Poker Face
Kathryn Wang TP Design Proposal

Description

Poker Face allows poker players to see their readable emotions as they play their game, helping them train their "poker face" and also incorporating computer AI that plays based on their expression.

Competitive Analysis:

In the Term Project Gallery, I saw in Fall 2019, Etan Cohn created Program Poker which used a computer AI to program single player poker and calculate the probability of winning for the player at each point in the game. I haven't seen a project online yet that incorporates facial expressions into online poker, so I think it will be different from what I have seen.

Facial recognition seems to be pretty common in term projects, where other students have used facial cues to determine if someone is lying and as shown in class, trying on different glasses. There was a term project by Jenny Han that was an emotion detector, which is similar to what I hope to do for part of my project.

Structural Plan

- HighestHand File
 - Contains the functions needed for determining the highest hand
 - Takes in a list of cards (hand)
 - Each type of poker hand (Straight flush, four of a kind, full house, etc.) will have its own function that determines if the given cards contains that hand
 - The HighestHand function will determine a player's highest 5-card hand based on the given cards
 - Each "level" of hand is given a number and that number is returned so that it can later be compared amongst different hands. The "kickers," as in the cards that determine tie breakers of a hand, will also be returned. The kickers will be different data types depending on the hand. For example, a straight flush will return the rank of the lowest card in the straight, where as a pair will have to return the ranks of the other three highest cards.
- PlayingCard class
 - Contains the different types of cards in the deck
 - Shuffling of cards
- Player class
 - Will contain the cards of each player, their player "number"/username, and potentially the OpenCV information

- Contains the amount of dinex each player has for “betting” purposes
- Deal Cards File
 - Contains function for dealing cards
- GetWinner File
 - Takes in a list of players
 - Will call the HighestHand function on the hands of each of those players and store the values returned
 - It will first compare the first value returned by each call because it will tell us which hand is the highest “level”
 - If different players have the same level, then the returned kickers will be compared.
 - Includes a tie breaker method
- AI Betting file
 - The Betting method will be called after every round of cards is revealed. Uses user’s facial expression and computer’s hand to make a move.
- Main “KathrynTermProject” file
 - Controls the graphics and emotion recognition
 - Also calls the necessary functions to determine what to display and control the game
- Emotion Detector File
 - Stores the emotion information
 - Detects player’s emotion and “average emotion”

Algorithmic Plan:

Some of the algorithmic details are described above, but before any modules are used, the most algorithmically complex part is determining the winner of the poker game since there are a lot of cases and edge cases. I wrote out a diagram explaining what each hand functions returns and how those return values will be compared to determine the winner.

Hand:	Returns:
Straight Flush	→ 1, lowest card rank
Four of a kind	→ 2, (four rank, single rank)
Full House	→ 3, (triple rank, double rank)
Flush	→ 4, (5 cards)
Straight	→ 5, lowest card rank
Three of a kind	→ 6, (remaining two)
Determining winner will be comparing the first number returned. If it's the same	
↓	

Tie Breaker Function

→ takes multiple lists of same number of single cards and determines the highest. If highest are the same, goes to second highest and so on.

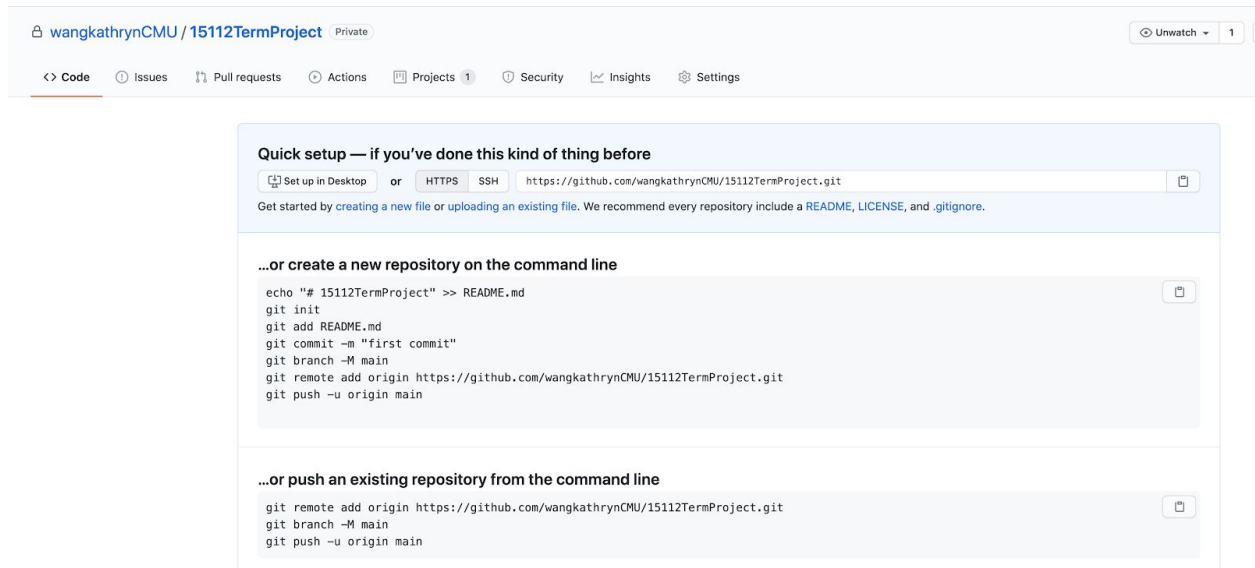
Timeline Plan:

TP1: Finish the highest hand function that determines the highest hand based of a list of cards.

Saturday (TP2): Finish the entire basic poker game with betting and graphics, and computer AI that plays off of hand.

Wednesday (TP3): Add computer vision aspects and sockets

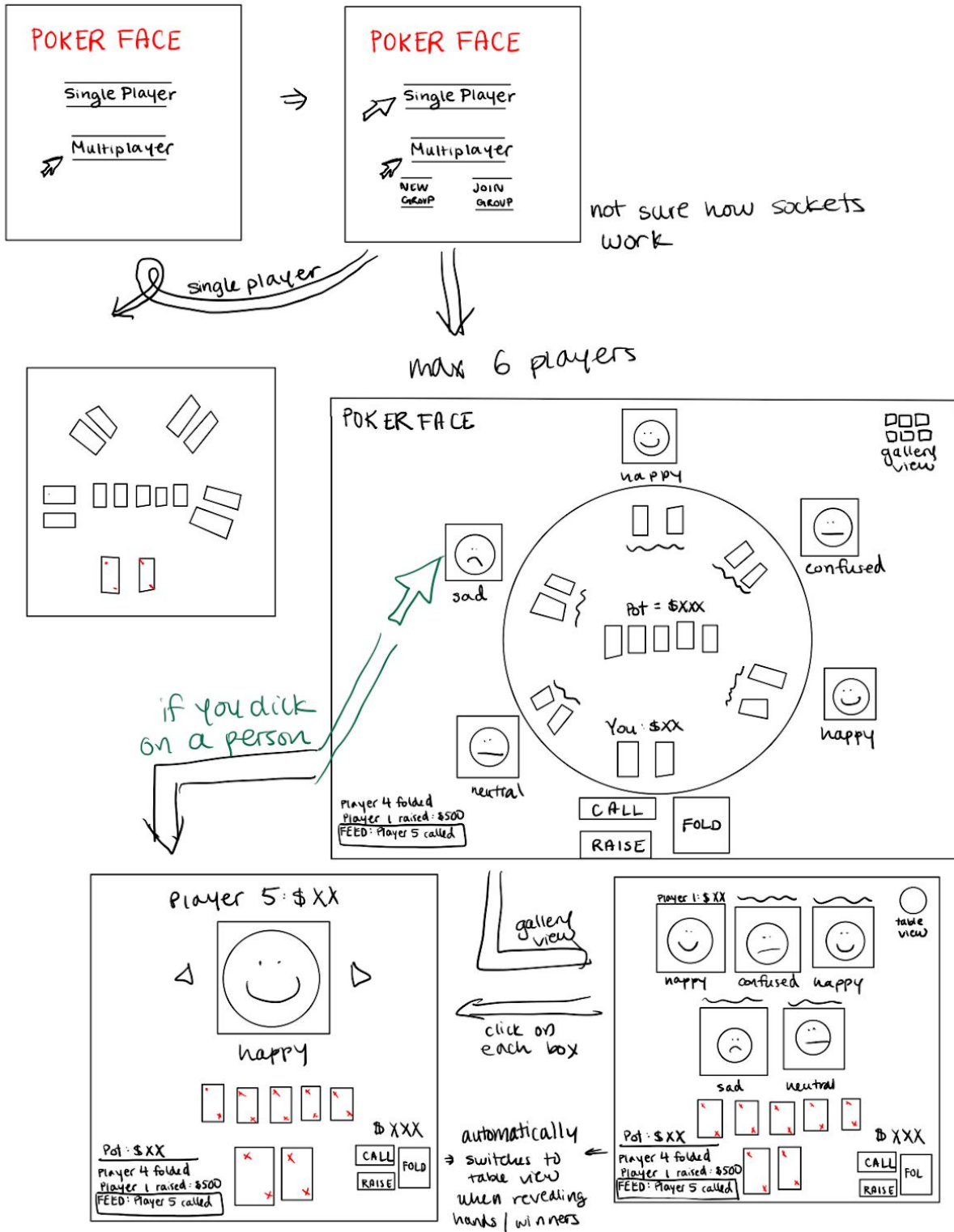
Version Control Plan: I'm planning on backing up my code using github.



Module List: OpenCV, dlib

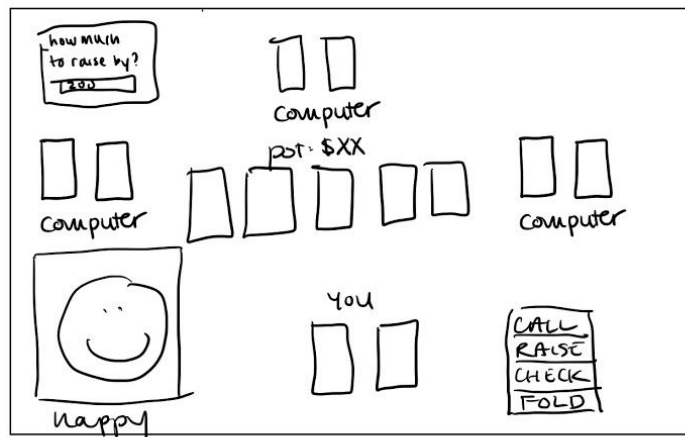
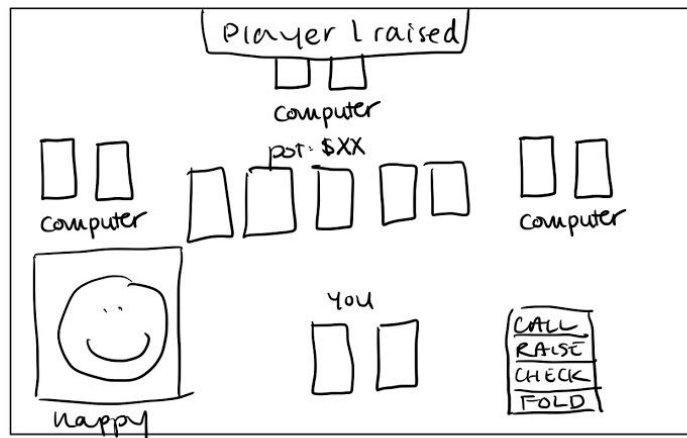
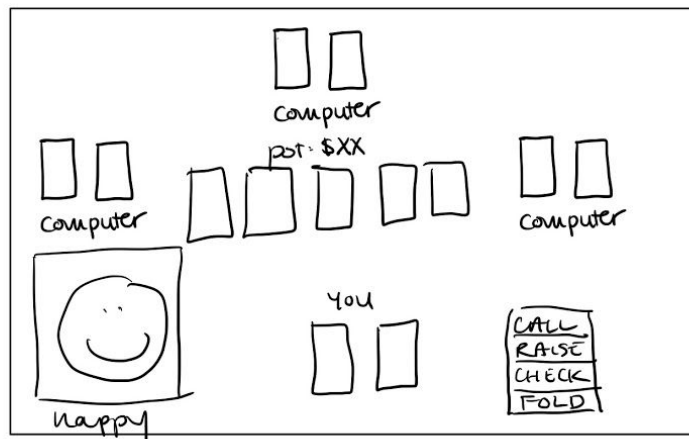
Storyboard

TPI:



TP2 Updated Design:

New Design: Splash is still the same



Graphic Design didn't change for TP3!