**CS318 Project Course**

**Jokers**

By

**Christian Moncada**

**Daniel Murtagh**

**Ryan Rogers**

Supervisors

**D. Cenk Erdil, PhD**

**Prof. Robert McCloud,** **PhD**

*Submitted in partial fulfillment of the requirements for the degree of*

*Bachelor of Science*

at

Sacred Heart University, Fairfield, CT, USA

May 2019

Copyright by Christian Moncada, Daniel Murtagh, Ryan Rogers, 2019

All Rights Reserved

Jokers

by

Christian Moncada

Daniel Murtagh

Ryan Rogers

APPROVED BY:

CAPSTONE COURSE INSTRUCTOR: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

FACULTY MENTOR: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

ASSOCIATE DEAN OF THE SCHOOL \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

TABLE OF CONTENTS

SIGNATURE PAGE ...i

EXECUTIVE SUMMARY (one-pager) ...1

CHAPTER 1. PROBLEM STATEMENT ...2

CHAPTER 2. BACKGROUND (research on what’s out there) ...3

CHAPTER 3. DESIGN APPROACH ...4

A. Alternatives considered

B. Project plan and schedule

CHAPTER 4. DESIGN DESCRIPTION ...5

A. Reproducibility (sufficient detail to allow someone to repeat) 6-7

B. Testing procedures and results (appendices are okay) ……………………….. 8-10

CHAPTER 5. CRITICAL EVALUATION OF DESIGN 11

A. Benefits and limitations of design

B. Sections that are not resolved 12

CHAPTER 6. DISCUSSION 13

A. What has been learned

B. Potential problems …………………………………………………………………….

C. Future work (what is next) …………………………………………………………14-15

APPENDIX A. <List of Graphs> ....iii

GRAPHS ……..……………………………………………………………………………... iv-vi

APPENDIX B. <List of Questionnaires> ...vii

QUESTIONNAIRES ………………………………………………………………………. viii-x

LIST OF GRAPHS

1. Initial Gameplay Testing Results iv

2. Ease of Play iv

3. Gameplay Testing Results (Version 2.2) ………………………………………………. v

4. Ease of Play (Version 2.2) ………………………………………………………………. v

5. Gameplay Testing Results (Version 2.3) ……………………………………………… vi

6. Ease of Play (Version 2.3) ………………………………………………………………. vi

LIST OF QUESTIONNAIRES

1. Gameplay Testing Questionnaire (Game Version 2.1) vii

2. Gameplay Testing Questionnaire (Game Version 2.2) ……………………………… viii

3. Gameplay Testing Questionnaire (Game Version 2.3) ……………………………… ix

**Gameplay Testing Questionnaire**

1. Have you played Blackjack before?
2. Have you played a virtual card game before?
3. Did you understand how to play Jokers?
4. How easy was it to play Jokers on a scale of 1-5?

1 2 3 4 5

(Not-At-All) (A-Little) (Neutral) (Mostly) (Definitely)

1. Were the buttons clear and easy to understand?
2. Did you enjoy the visual layout of the game?
3. Would you play Jokers again?
4. Would you recommend Jokers to a friend?

**Gameplay Testing Questionnaire**

(Game Version 2.2)

1. Have you played Blackjack before?
2. Have you played a virtual card game before?
3. Did you understand how to play Jokers?
4. How easy was it to play Jokers on a scale of 1-5?

1 2 3 4 5

(Not-At-All) (A-Little) (Neutral) (Mostly) (Definitely)

1. Were the buttons clear and easy to understand?
2. Did you enjoy the visual layout of the game?
3. Would you play Jokers again?
4. Would you recommend Jokers to a friend?

**Additional Questions**

1. Is the game play screen cluttered?
2. Are there card-shuffling buttons you feel are pointless?
3. Did you like round element and winnings-per-day in game?
4. Do you know what the register is?

**Gameplay Testing Questionnaire**

(Game Version 2.3)

1. Have you played Blackjack before?
2. Have you played a virtual card game before?
3. Did you understand how to play Jokers?
4. How easy was it to play Jokers on a scale of 1-5?

1 2 3 4 5

(Not-At-All) (A-Little) (Neutral) (Mostly) (Definitely)

1. Were the buttons clear and easy to understand?
2. Did you enjoy the visual layout of the game?
3. Would you play Jokers again?
4. Would you recommend Jokers to a friend?

**Additional Questions**

1. Was the tutorial helpful?
2. Was the added difficulty setting more enjoyable?

EXECUTIVE SUMMARY

Daniel, Ryan, and I have set out to do for our Senior Capstone project a videogame based upon the popular casino card game, BlackJack. Our project and game is titled, Jokers. Just to give a brief background on the team: Daniel is a Computer Science major focusing on the Game Design tract, Ryan also a Computer Science major focus in Game Design, and I am a Computer Science major focusing in Information Technology tract. Daniel has taken the role of UI/Front End developer, Ryan of AI/Back End developer, and I have taken the role of Data Analysis, Documentation & Testing. This project started in the fall of 2018 and is excepted to be completed by the spring of 2019. We feel as we have an extremely strong team for this project, as we each bring different strengths from each area that encompasses the study of Computer Science at Sacred Heart University. Our Capstone supervisor is Prof. D Cenk Erdil, PhD and our faculty mentor is Prof. Robert McCloud, PhD.

Chapter 1

Problem Statement

When playing a typical game of blackjack, one may find it to be simple in terms of mechanics. To master this game, a player must go beyond folding and raising, and hitting. They must efficiently calculate their odds of winning, react accordingly, and bluff in a convincing manner to make a profit. To newcomers, this game seems to be just a game of chance, because they cannot possibly bluff when they do not know the estimated value of the dealer hand. Some video game versions of this game calculate the player’s chances of winning for them. In addition, players do not have to pay attention to their own “tells” because their computer does not have the ability to read them. In that case, why bother playing? To effectively make a blackjack game in the context of a video game, one should focus on the difference between the physical and virtual mediums. Enter Jokers, a reimagined game of video blackjack that encourages players and opponent AIs to cheat. By using different cheating methods and card mechanics such as false shuffles, dealing seconds, bottom dealing, and so forth; you, the dealer, will have to find ways to out cheat your opponents. We intend to invite new players who have never played blackjack before to understand the game a lot better through a different lens.

Chapter 2

Background

We found inspiration from some existing game such as Papers Please. Whose day-to-day income system influenced us to make Jokers. Our story features the main protagonists’ daily job (the dealer) to survive day-to-day on paychecks. Based on his success in winning blackjack games for the casino. Another game that inspired us wasFortune 499. The game features a card-based attack system that allows you to use card mechanics (e.g. palming cards), which adds an element of strategy to an otherwise luck-based game. Games were not the only source of inspiration for our game Jokers.Richard Turner on Penn & Teller Fool Us! (Television) excellent mechanic play is the type of feeling we want the player to achieve. By manipulating the card deck in certain types of ways using different card mechanics as shown by Richard Turner, we aim to make the player a master manipulator of cards just like him. Then of course for the user interface of the game we drew inspiration from flash games such as the multitude of casino games found on sites such as Miniclip.com and mobile games offered by Zynga. These inspirations drew us to make Jokers a game with 3 main objectives. Player motivation, unique mechanics, and a familiar yet captivating layout.

Chapter 3: Design Approach

1. Alternatives considered

* The original plan for Jokers was that it would be a poker game played in the style of Texas Hold ‘EM. We were developing AI for the game players to be able to Bet, Raise, Call, and Fold for themselves with the objective of the dealer to purposely make them lose via marking and dealing cards. After consulting with Prof. McCloud, he suggested to us to make the game easier for not only people play but for us to design and make by switching to Blackjack. This would allow us to fine tune and design code more to our liking.

1. Project Plan & Schedule

### Game Concept

- First 2 months

- Game Title and concept

- Problem Statement

- Data Gathering and Research

### Documentation & Resource Management

- Following 2 months

- Rough Outline of GDD complete

- Allocation of Tasks

- Acquiring necessary resources

### Development & Testing

- Following 2 months

- Code front end

- Code back end

- Artwork

- Testing

### Updates and Presentation

- Last 2 months

- Fix bugs

- Gameplay Testing

- Work on Presentation

- Final Presentation

Chapter 4: Design Description

1. Reproductivity (In-Depth)

* Game Story
  + You are playing as a dealer for a corrupt casino, Jokers Casino. Your objective is to find anyway to win via using card mechanics, deck shuffles, marked cards, and different types of deals to win the game either for the casino or a specific person for the casino. This will be a 2D first person blackjack game where the player will play as the dealer. They will have certain options at the beginning of the round such as selecting which cards to mark, how to shuffle the deck, and how to deal out the deck. Some of these mechanics can be noticed by the other player AI, and if they notice it, they will call out the player for cheating and the round will end
* Deck Mechanics
  + Manipulating the positions of cards by doing different kinds of shuffles and false shuffles
  + Before each round, the dealer (i.e. the player) must shuffle the cards in the following order: Riffle, riffle, strip, riffle, cut. However, the player can opt to do a false shuffle on any of these operations to gain an advantage. During the shuffling phase, a user interface will pop up that will display where they are in the shuffle operation order and present buttons that will allow the player to either shuffle or false shuffle
* Card Mechanics
  + Dealing Cards: The player can deal from different parts of the deck. This is the player’s primary tool for manipulating the game
  + How it works: During each game, the player can select which type of deal they would like to perform. The player is able to deal normally as well as perform second deals (dealing the card second from the top) and bottom deals (dealing the card from the bottom of the deck)
* Marked Cards
  + Details (remember: Temporary and permanent): The player will be able to mark cards through a physical marking system (which are tracked throughout the game) and via card counting (which are tracked throughout each round). While a card is marked, the player will be able to see where that card is while it is in someone’s hand, on the table, or in the deck
  + How it works: At the start of the first round, the player will select a set of cards (the size of this set is defined by what upgrades they have) to permanently mark as well as three cards that they will temporarily mark for the round. At the end of each round the temporarily marked cards from the last round are forgotten, then the player will be able to select a group of cards (a group is defined as either the cards in a single player’s hand or the community cards) that then become the next set of temporary cards
* Currency
  + Details: The player’s income is dependent on how well they did in the game, represented as a percentage of their winnings. They have a base amount of expenses that they pay after each day. Optionally, the player can buy cosmetics and upgrades with their remaining cash
  + How it works: Currency will be based on the players performance each match. Depending on if the player won the match, they will be rewarded a base currency of $500 a night, plus any bonuses (e.g. they gain a percentage of their winnings). If the player no longer has any money and loses a blackjack match, they will get a bad ending. The penalty is simply having to replay that blackjack match
* 2D
  + Textures: Card Textures
  + Character Sprites: Character Animations
  + Text Mesh Pro
* Sound
  + Sound List (Ambient)
    - Inside
      * Jazzy casino music
      * Main Menu Music
      * Cutscene Music
      * Bad end music
      * Game won music
      * Shop Menu music
  + Sound List (Gameplay)
    - Cards
      * Deck being shuffled
      * Card being dealt
* Animation
  + Environment Animations: Dynamic Background (people moving, lights changing, etc.)
  + Character Animations: NPC, Idle Animations, etc

1. Testing Procedures & Results

* Initial Gameplay Testing (Game Version 2.1)
  + What we did is we took 10 random people and gave a brief explanation of the game and controls and let them play one full round of Jokers
  + Afterwards, we had them fill out a brief questionnaire (8 questions)
* Below are the results:

Question #1: 7/10 answered yes

Question #2: 10/10 answered yes

Question #3: 9/10 answered yes

Question #4: 1 = 2/10

2 = 1/10

3 = 0/10

4 = 5/10

5 = 2/10

Question #5: 9/10 answered yes

Question #6: 8/10 answered yes

Question #7: 9/10 answered yes

Question #8: 9/10 answered yes

* Gameplay Testing (Game Version 2.2) (3/19/19)
  + Another 10 random people were asked to test an updated version of Jokers
  + Included in this round of testing are an additional 4 questions added to the questionnaire, addressing new UI/elements included in this version of the game
  + Included in this update is a settings page, updated gameplay UI/font, and added elements to the actual game play such as numbered rounds and winnings-per-day
  + This round included a questionnaire of 12 questions
* Below are the results

Question #1: 6/10 answered yes

Question #2: 9/10 answered yes

Question #3: 6/10 answered yes

Question #4: 1 = 0/10

2 = 0/10

3 = 3/10

4 = 4/10

5 = 2/10

Question #5: 10/10 answered yes

Question #6: 10/10 answered yes

Question #7: 10/10 answered yes

Question #8: 9/10 answered yes

Question #9: 2/10 answered yes

Question #10: 1/10 answered yes

Question #11: 9/10 answered yes

Question #12: 3/10 answered yes

* Gameplay Testing (Game Version 2.3) (3/28/19)
  + 10 additional people were randomly selected for our 3rd round of testing
  + Included in this round of testing is a finished tutorial section, explaining the different card mechanics and a how-to-play section
  + Also included are updated UI elements and a variable difficulty control
  + This round included a questionnaire consisting of 10 questions
* Below are the results

Question #1: 6/10 answered yes

Question #2: 9/10 answered yes

Question #3: 7/10 answered yes

Question #4: 1 = 0/10

2 = 0/10

3 = 2/10

4 = 6/10

5 = 2/10

Question #5: 7/10 answered yes

Question #6: 7/10 answered yes

Question #7: 8/10 answered yes

Question #8: 7/10 answered yes

Question #9: 5/10 answered yes

Question #10: 7/10 answered yes

Chapter 5: Critical Evaluation of Design

1. Benefits & Limitations of design

* The benefits of our game design are its simplicity and intuitive play. When creating and designing this game, we didn’t set out to reinvent the wheel as they say. We wanted something that was familiar to frequent players yet easy enough for anyone to pick up regardless of prior skill/experience. Through the initial game test, we can see that over 80% of people that played Jokers not only understood the basics of the game and enjoyed the user interface but would play again and recommend Jokers to others.
* That is not to say that the game is perfect or have its flaws. Also noted in the initial testing, when people were asked to rate the game’s ease of play on a scale of 1-5, 20% of people rated the game at a 1 and 10% at a 2. Accounting for 30% of the participants that voted under 3 (Neutral). So, there were people who overall did not understand the game even after the brief game intro and trial. Also to be noted, a participant of the trial gave very good feedback to us by commenting:

“…it could use some polishing and a real objective instead of just game after game. Maybe make a game mode a series of at least 10 deals, and see where you get in the end”

In response to Question #5, “somewhat, needs little descriptions”

In response to Question #6, “No, needs polishing”

1. Sections that are not resolved

* Currently the parts of the project that are not yet resolved are as follows:
  + - * The Marked Card Mechanics
      * Full game background images/design (partially done)
      * All Character Animations
      * Main Menu (partially done)
      * Settings Window
      * All Sound (partially done)

Chapter 6: Discussion

1. What has been learned

Going from concept to product is never seamless nor goes according to schedule. The initial scope of a project is not written in stone. We had a clear and firm concept as for project. Our efforts were aimed at a poker-based game. After meeting with our mentor for the second time, he had advised us to change the scope of the game and switch to a Blackjack-based card game. Prof. McCloud recommended our group to do this in order to write our code more efficiently and quickly as we were running into time constraints. One of the main points we have learned from this capstone project so far is the importance of conceptualization and proper time scheduling. We also learned about the importance of backing up our progress. We ran into an issue at one point where a group member’s laptop was stolen along with the only copy of our GDD. Although the laptop was eventually recovered, that event acted as a wake up call for us.

1. Potential Problems
   * Marked Card Mechanics
     + - The finishing touches are being done on the code to implement the Marked Card function within the game
   * Animations and Artwork
     + - Dan is reporting troubles having the characters perform animations during the actual game
   * Gameplay Bugs
     + - During the initial round of gameplay testing, some bugs were found with regards to button functions and the UI
       - UI when displayed full-screen is not in a great resolution
2. Future Work

* Additional rounds of game testing
  + After every major game update, we would like to test the game with audiences to get feedback on gameplay, UI design, interest, etc.
* Poster Presentation & Power Point Presentation
  + We are going to complete a visual overview of our project by form of poster.
  + Which will include: About the team, Brief Overview, Gameplay, Artwork & Animations, Data & Research.
  + Practicing for the final Capstone presentation.
* Gameplay Scalability
  + We eventually want to implement a way to play against anywhere between 1 and 4 players.
* Marked Card Mechanics
  + Ryan and Dan are going to working on fixing the bugs in the marked card mechanics and successfully implement it into the game.
* Animations
  + After the marked card mechanics have been implemented, tested, and polished, animations will be added into the game.
  + Characters on screen will go through their animations whenever they make an action.
  + Casino chips will move between each player and the dealer to provide visual polish and act as a visual representation of who won.
* Finishing touches on UI design/functionality
  + This includes Main Menu, Gameplay, Settings Menu.
  + Ensuring all buttons function as intended and correctly.
  + Any overall gameplay bugs/flaws.