

PROJECT PROPOSAL

BLACKBEARD

Learn from the greatest Blackjack AI

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DGMD E-14 – FALL 2021 HARVARD UNIVERSITY



1. INTRODUCTION



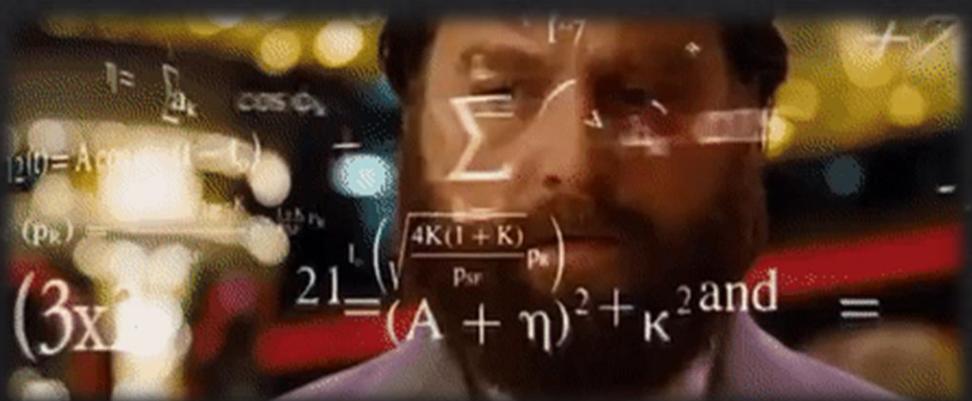
1.1 DESCRIPTION



Team Jaqen wants to build Blackbeard, a world class blackjack AI, that trains your ability to play blackjack from a wearable device in real time. The challenges Blackbeard will face are as follow: object detection, object classification, mathematical probabilities, hand motion recognition, and more.

- ❖ Disclaimer:

- ❖ *The device is intended for academic use or training purposes only.
Card counting is not illegal under Federal, State, or Local law.*



1.2 GOAL OF THE PROJECT



- ❖ Primary Application: Blackjack trainer
- ❖ Secondary Market:
 - ❖ Counting + CV: Pharma, Library, Factory, Robotic, etc.
 - ❖ Gesture: AR, Gaming, Drone, etc.



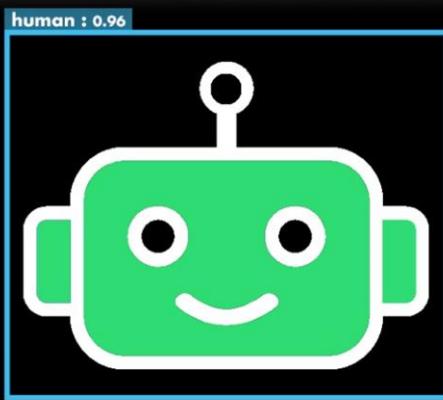
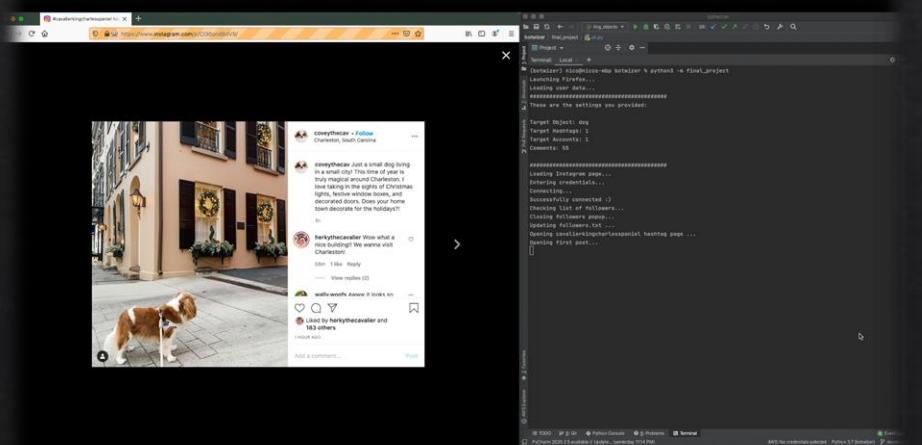
1.3 INSPIRATION & RELATED WORK



Player hard	Dealer's card									
	2	3	4	5	6	7	8	9	10	A
4-8	H	H	H	H	H	H	H	H	H	H
9	H	Dh	Dh	Dh	Dh	H	H	H	H	H
10	Dh	Dh	Dh	Dh	Dh	Dh	Dh	Dh	H	H
11	Dh	Dh	Dh	Dh	Dh	Dh	Dh	Dh	Dh	H
12	H	H	S	S	S	H	H	H	H	H
13	S	S	S	S	S	H	H	H	H	H
14	S	S	S	S	S	H	H	H	H	H
15	S	S	S	S	S	H	H	H	Rh	H
16	S	S	S	S	S	H	H	Rh	Rh	Rh
17+	S	S	S	S	S	S	S	S	S	S

Low Cards					High Cards					
2♦	3♦	4♦	5♦	6♦	7♦	8♦	9♦	10♦	J♦	A♦
2♥	3♥	4♥	5♥	6♥	7♥	8♥	9♥	10♥	J♥	A♥
+1	+1	+1	+1	+1	-	-	-	-1	-1	-1

1.3 INSPIRATION & RELATED WORK



BOTWIZER



2. TEAM ORGANIZATION



2.1 TEAM MEMBERS AND ROLES

- ❖ Nicolas Morant:
 - ❖ Object (Card) Detection
 - ❖ Card Value & Color Recognition
 - ❖ PowerPoints & Read.me
 - ❖ Prototype Design
 - ❖ Testing

- ❖ Huayu (Jack) Tsu:
 - ❖ Blackjack Strategies
 - ❖ Hands Motion Recognition
 - ❖ UX Controller
 - ❖ Documentation
 - ❖ Testing



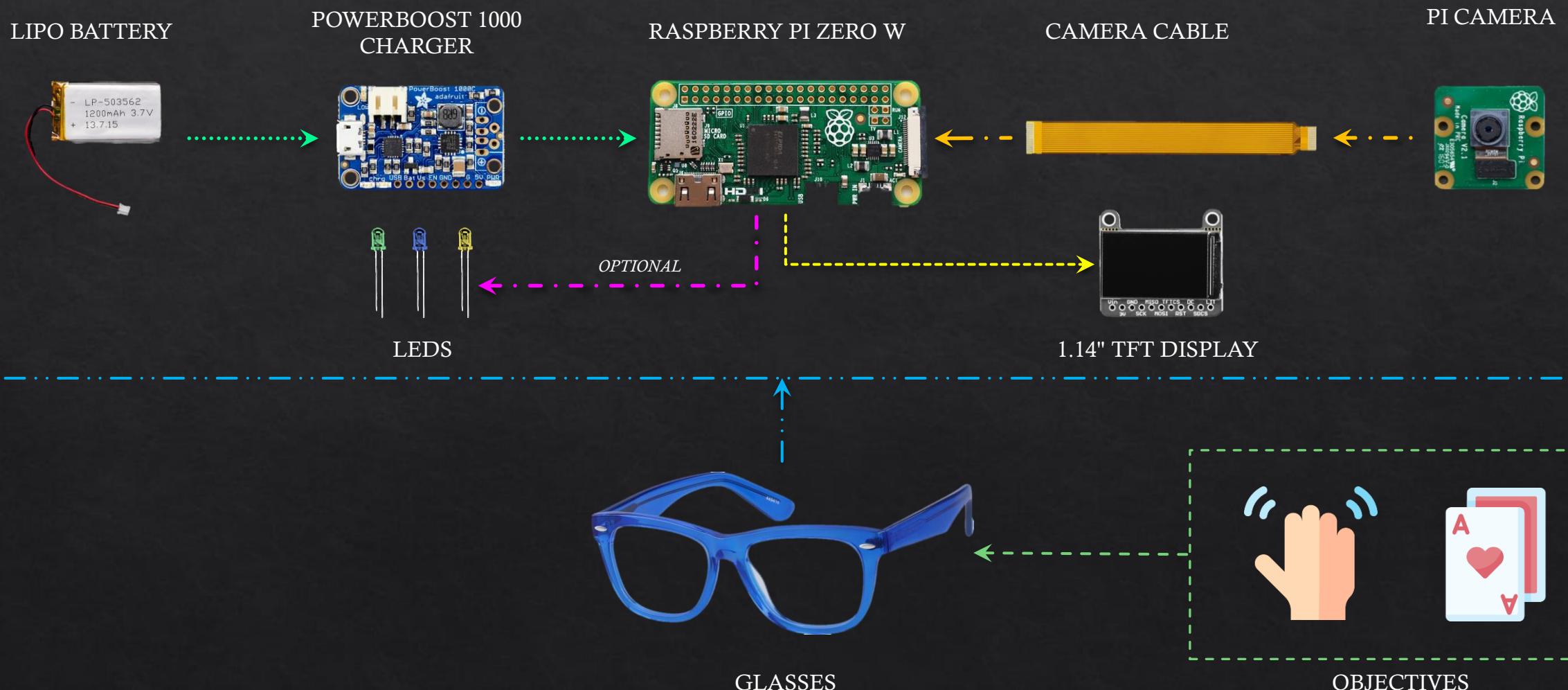
3. EQUIPMENT & ARCHITECTURE



3.1 SOFTWARE



3.2 ARCHITECTURE



4. LIST OF MILESTONES



4.1 OUTLINE AND SCHEDULE



Week	Date	Milestone
4	20-Sept	Setting up software and hardware
5	27-Sept	Testing hardware features and functionalities
6	4-Oct	Writing project proposal
7	11-Oct	Project proposal submission (12-Oct)
8	18-Oct	Phase 1: Object detection; Blackjack strategy – Demo
9	25-Oct	Phase 1 features – Finalized
10	1-Nov	Phase 2: Object classification; Hand motion recognition – Demo
11	8-Nov	Phase 2 features – Finalized
12	15-Nov	Phase 3: Integration & Testing – Planning
13	22-Nov	Phase 3 features – Demo
14	29-Nov	Phase 3 features – Finalized
15	6-Dec	Presentation preparation + Bonus phase
16	13-Dec	Project submission and presentation

5.2 PHASES

Build The Basics

Tasks:

- Detecting playing cards
- Blackjack Strategies

PHASE 1

PHASE 2

Integration & Testing

Tasks:

- Fuse all features from phase 1 & 2
- Prototype design
- Testing

PHASE 3

BONUS PHASE

Developing Main Functions & UX

Tasks:

- Playing cards classification
- Hand gesture recognition

If Time Allows

Tasks:

- Real-life environment testing

5. TEAM MEETING SCHEDULE



5.1 TEAM MEETING SCHEDULE



More meetings will be added as needed throughout the semester.



*BLACKBEARD
COMING SOON
TEAM JAQEN*