

Project Plan

Sdmay22-10

Frankie Mago, Hailey Lucas, Christian W





Project Management/Tracking Procedures

- We will use Gitlab for project management.
- Google Drive for documenting.
 - All of our formal documents and meeting notes will be in a shared Google Drive.
- Discord for communication and logistics.
 - We have multiple channels for different notes, research, ideas, etc.



Task Decomposition

Our Tasks are as follows:

- Finish coursera course
- Research hardware
- Acquire hardware
- Research similar software implementations (alexa, google etc)
- Gather data
- Design locking mechanism
- Software design
- Implement algorithm on edge impulse
- Implement software
- Test software
- Implementation testing
- Complete course assignments



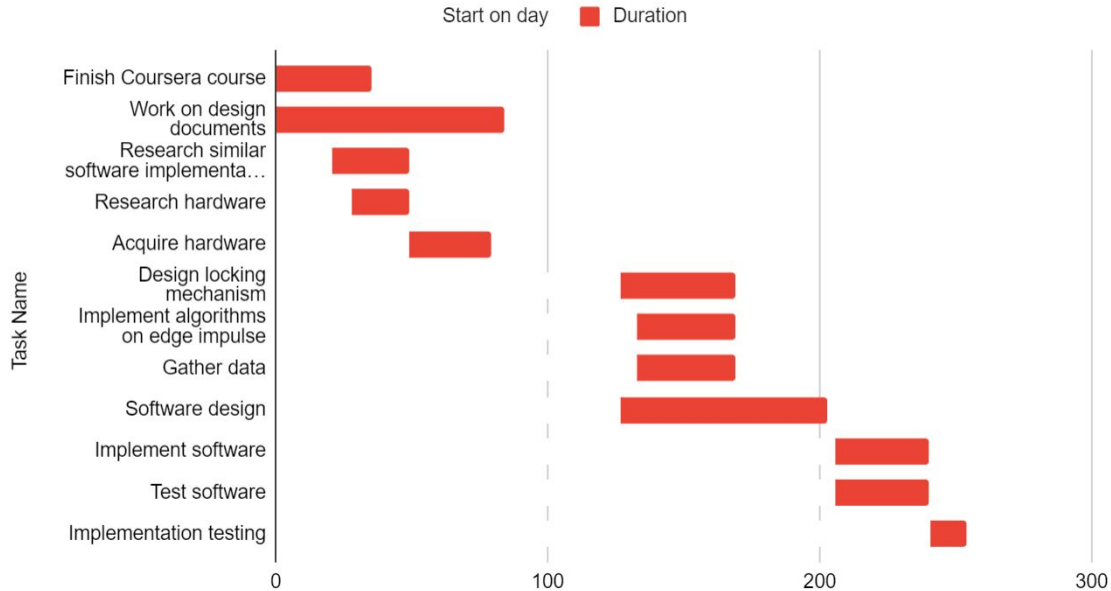
Project Proposed Milestones, Metrics, and Evaluation Criteria

Milestone	metric
ML algorithm detects a specific person saying a keyword(ML version 0.1)	90% accuracy
ML algorithm differentiates between different people saying the keyword(ML version 0.2)	90% accuracy per person
ML algorithm can detect a given user's voice and their user-defined keyword(ML version 0.3)	90% accuracy
microcontroller moves motor to unlock door on correct keyword recognition(ML version 1.0)	Motor switches consistently within 5 seconds of receiving keyword



Project Timeline/Schedule

Gantt Chart





Risks And Risk Management/Mitigation

-Finish Coursera course

- Not everybody finished on time. Risk: 0.1

-Research hardware

- Unsure of what hardware to use. Risk: 0.2

-Acquire hardware:

- Hardware may not be available due to supply chain shortages. Risk: 0.4

-Research similar software implementations (alexa, google etc)

- Specific implementation details are unavailable. Risk 0.3

-Gather data

- Unable to gather enough data for training. Risk: 0.6
 - Mitigation: Use available audio resource packages from google or other companies that have pre-recorded keywords to train our model
- The data is biased. Risk: 0.7
 - Mitigation: 1. Gather more data.
 - 2. Gather more data from more people with underrepresented characteristics.
 - 3. Use more audio resource packages as more data.

-Locking mechanism design

- The design does not work as intended and needs to be redesigned. Risk: 0.3



Risks And Risk Management/Mitigation con't

-Software design

- The design does not work as intended and needs to be redesigned: 0.3

-Implement algorithm on edge impulse

- Accuracy is not as high as we want it to be. Risk 0.5
 - Mitigation: Redesign different aspects of the algorithm (nodes, layers), gather more data, gather more diverse data

-Implement software

- We don't have enough time to implement all the planned software features: Risk 0.4

-Test software

- We don't have enough time to implement full test suites: Risk 0.4

-Implementation testing

- We don't have enough time to implement full test suites: Risk 0.2

-Complete course assignments

- We don't have enough time to finish all course work: Risk 0.1



Personnel Effort Requirements

Task	Person-Hours
finish coursera course	10
research hardware	10
acquire hardware	5
research similar software implementations	10
gather data	100
design locking mechanism	30

software design	60
implement algorithm on edge impulse	50
implement software	60
test software	60
implementation testing	20
complete course assignments	



Other Resources

- Microcontroller
- Motor
- Microphone
- Power source
- Lock
- Phones
- Audio files
- Possibly HPC cluster time