Project Plan

SDDec23-04

Project Management

- Agile
  - Split project into several distinct parts
  - Quick feedback for website usability
- GitLab
  - Store and share code
  - Assign team member tasks
  - Review code changes

TASK DECOMPOSITION

- Setup YOLOv5 to identify how many people are in a lab room
  - Python code to identify people in a controlled environment
  - Identify people in a real lab

- Create a database that stores lab data
  - Add lab schedules for each lab room
  - Read and write current lab usage data

- Create a website that displays lab schedules and current usage
  - Overview home page that displays list of tracked labs and current usage
  - Page for each lab room with more detailed information including lab schedule, capacity, and usage

- Create a server to integrate components
  - Run the YOLOv5 code to get an image from a lab room and determine current lab usage
  - Write the lab usage data from YOLOv5 to the database
  - Display the current lab data on the website

Project Criteria

- Website will display current lab usage with 95% accuracy

- Website will load within three seconds

- Number of labs tracked:
    - Milestone 1: Tracking one lab in Coover Hall
    - Milestone 2: Tracking all labs in Coover Hall

- Website will have Canvas integration
    - Added to Canvas courses

- Website displays accurate lab schedules for Coover Hall

Project Timeline

- ☐ May 2023: Configure YOLO v5 to be able to accurately track people in select labs

- ☐ May 2023: Gather lab data and use that to accurately track computers currently in use in select labs

- ☐ May 2023: Figure out how Canvas integration works and implement it to website

- ☐ August 2023: Set up basic website

- ☐ September 2023: Expand YOLO v5 to accurately track people in all labs within Coover

- ☐ September 2023: Use Labstats to determine computers used in all labs within Coover

- ☐ October 2023: Have website be fully functional

- ☐ November 2023: Ensure Canvas integration is complete

- ☐ November 2023: Ensure data has 95% accuracy

- ☐ December 2023: Ensure everything is completed

Risks and Mitigation

- Task: Set up YOLOv5 to determine room capacity

- Risk: The machine learning algorithm is not accurate enough to be useful
  - Rely on LabStats or replicate LabStats functionality

- Task: Create a database for lab data

- Risk: Website listing class schedules is changed, schedule scraper stops working

- Task: Create a website that displays lab schedules and current usage

- Risk: Not enough time/resources to create adequate UI

- Task: Create a server to integrate components

- Risk: Website not able to scale with increasing user count

PERSONNEL EFFORT REQUIREMENTS

We have split Personnel Effort into four categories that reflect our functionality, totaling 455 Hours:

- Setup YOLOv5 – 170 Hours Total
  - Identify people in a controlled environment – 70 Hours
  - Identify people in a lab – 100 Hours

- Create Database – 75 Hours Total
  - Add lab schedules – 50 Hours
  - Read/Write lab usage – 25 Hours

- Create Website – 140 Hours Total
  - Overview page – 80 Hours
  - Individual lab room page – 60 Hours

- Integrate components – 70 Hours Total
  - Run YOLOv5 on the server –20 Hours
  - Write usage data to the database – 20 Hours
  - Read and display usage data from the database on the website – 30 Hours

OTHER RESOURCE REQUIREMENTS

Not many additional resources are required, since the project is mainly software. Additional requirements include:

- Cameras to monitor lab usage

- Server space
  - Database
  - Web-hosting