PIRM 2

SDDec23-04

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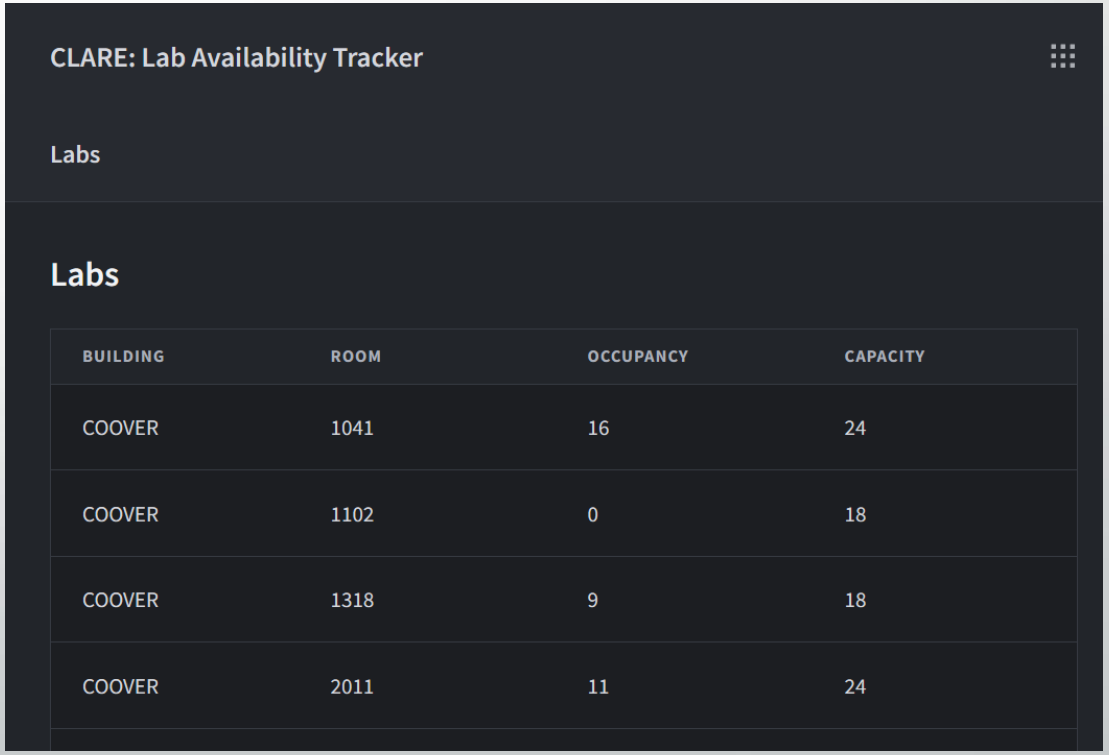
Problem

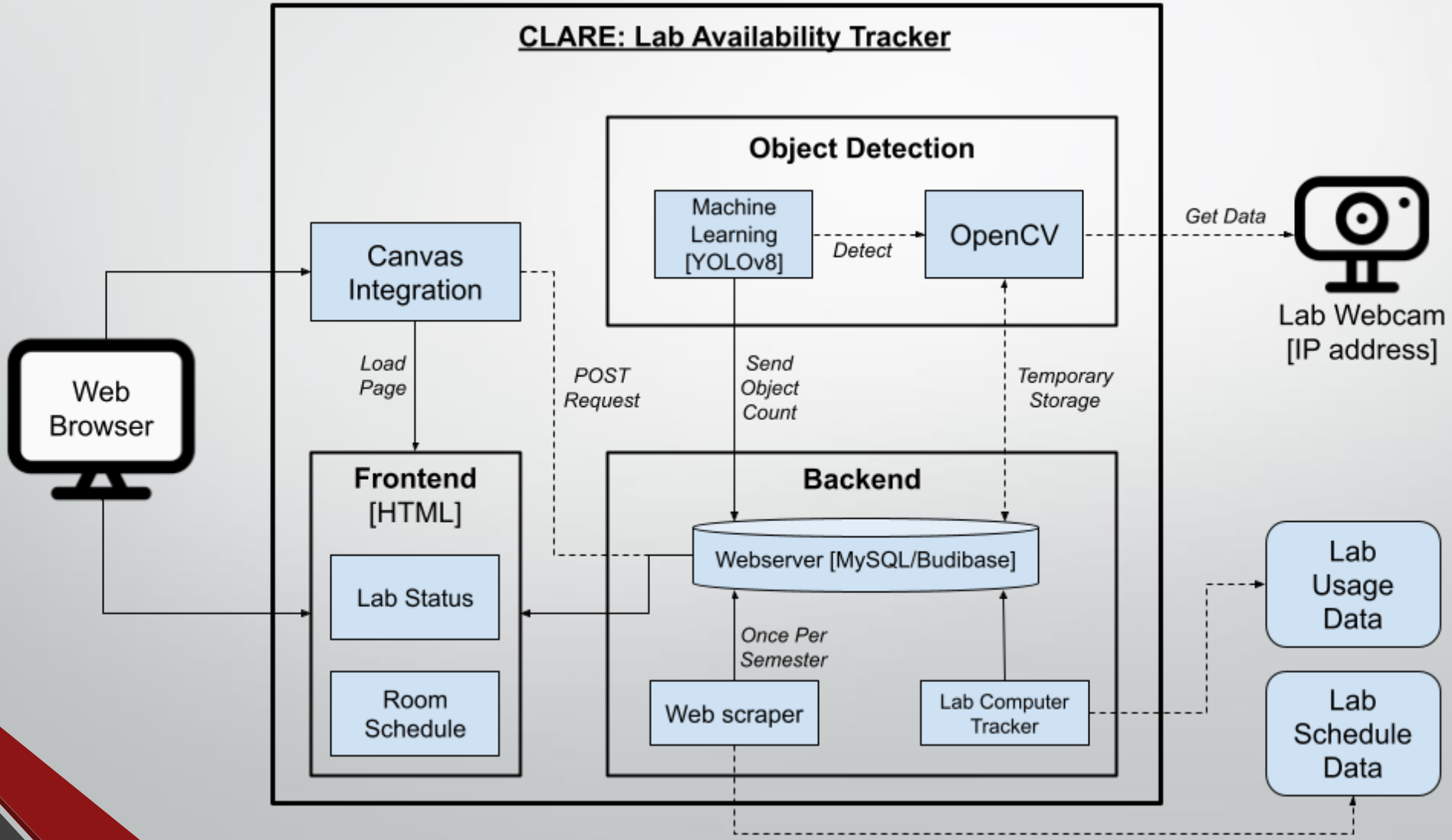
- Many engineering courses have assignments that require use of computer labs
- Labs have limited space and equipment
- Many labs do not have a way to check availability before going there
- Lab schedules are not readily available remotely

Solution: CLARE

- Website to display lab information
  - How many people are in the lab
  - How many computers are available
  - What is the lab schedule
  - What times are usually busy
- Collect current lab usage information

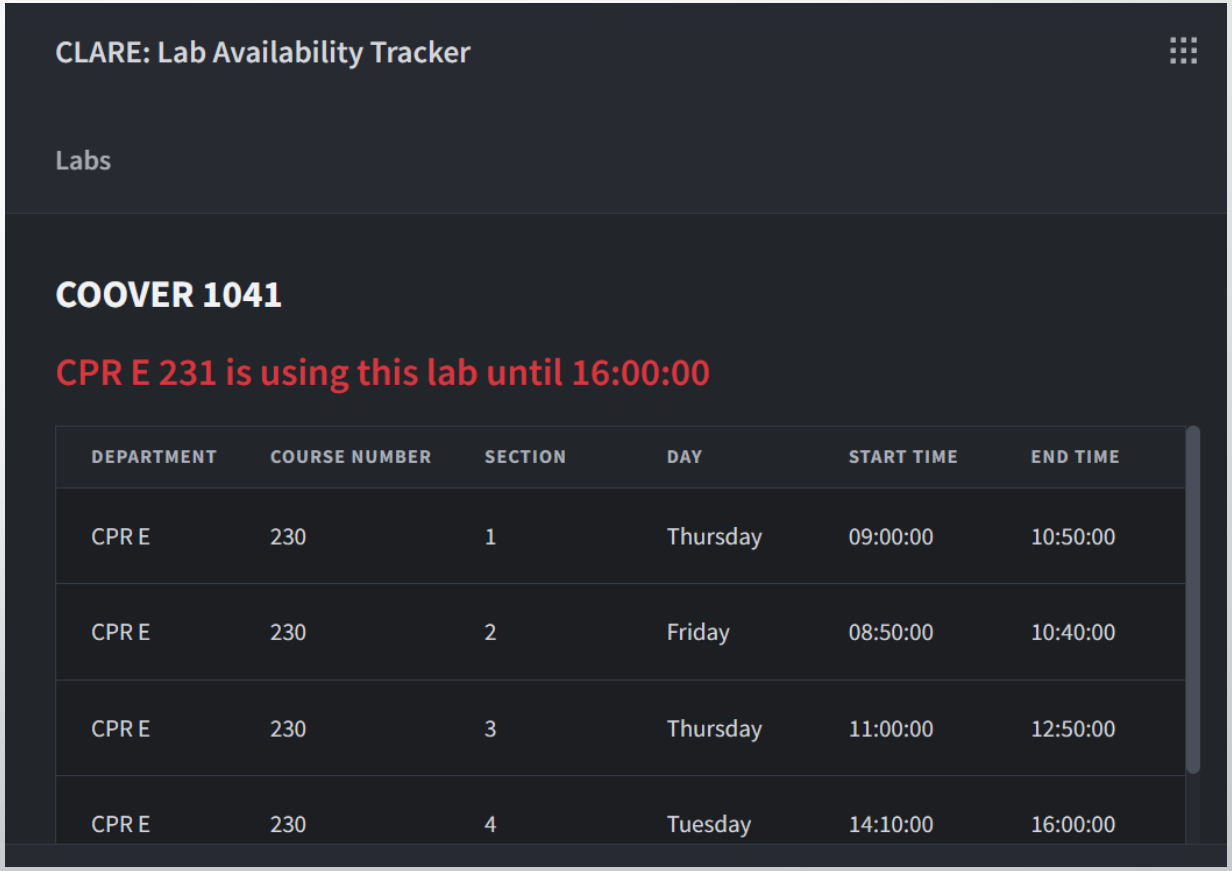


Technical Overview



Website

- Home page with a list of labs and quick overview
- Each lab has a page with more details
- MySQL database
- BudiBase for a codeless website solution
- Python scripts to update data



DEPARTMENT	COURSE NUMBER	SECTION	DAY	START TIME	END TIME
CPR E	230	1	Thursday	09:00:00	10:50:00
CPR E	230	2	Friday	08:50:00	10:40:00
CPR E	230	3	Thursday	11:00:00	12:50:00
CPR E	230	4	Tuesday	14:10:00	16:00:00

ML Script

- YOLO (You Only Look Once)
  - Machine learning model
- Retrieves data from webcam
- Uses ML model to get "best guess" for occupancy
  - Each detection must meet the confidence score minimum (%)
- Compares ML data to supplementary data
  - Extra data increases accuracy/confidence for results
  - Eventually passed to database

Computer Usage Tracking

- Computer vision data to be supplemented with computer usage
- Support for both Linux and Windows computers
- Installed on computers in lab and communicates with our server
  - Monitor system log files for changes to determine whether a login or logout has occurred
  - Use Windows logs to track the same for Windows computers
  - This information can be used in tandem with computer vision data to give a better headcount

Goals

- Fine-tune the camera ML for an indoor lab setting
  - Our current dataset is a general one, choose one that is more suited for us
- Integrate our solution with Canvas
  - Handle a POST request as specified in the Canvas API
  - Work with the Center for Excellence in Learning and Teaching to add our app
- Complete the lab computer login tracking app
- Improve the website interface

Technical Challenges

- Developing multi-platform logon tracking software
- Effectively combining computer usage data and CV data
- Learning LTI ecosystem for Canvas integration
- Scaling to all labs on campus
- Ensuring security and privacy for data collected

Thanks for Listening

Questions?