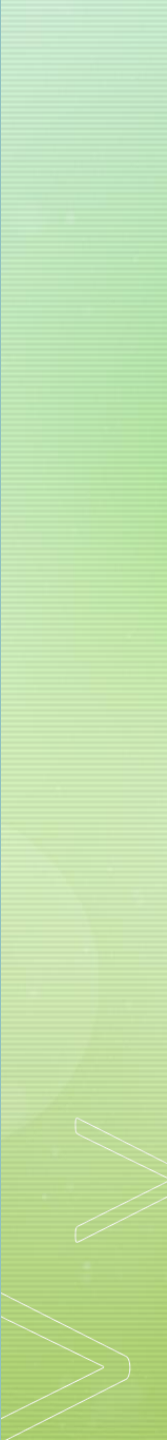# Design Plan

CLARE: The Lab Availability Tracker

SDDec2023-04

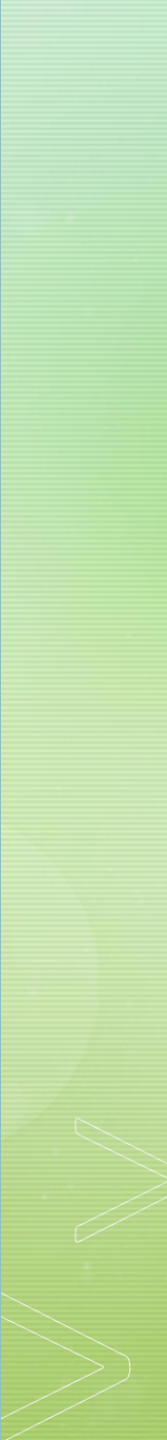Joel Neppel, Jorge Ortiz, Tyler Rolston, Franklin Sullivan, Evan Uhlmeyer

Problem Statement

- Lab work is required for many classes, but Coover Hall lab rooms are often full

- Checking lab occupancy can be inconvenient

- Existing tools for lab availability are expensive

- Need a way to view lab occupancy and schedule

Design Context

- ECPE students at ISU need a reliable way to see lab availability since they are dependent on the labs in Coover Hall to complete certain classes

- Previous solution (LabStats) was hard to find and provided limited information about the labs

Broad Design Considerations

- Student productivity
  - Lab capacity has a large impact on the productivity of students who use lab
  - Focus on making app easy to use and intuitive, allowing students to focus on their work

- Privacy
  - Design may include cameras placed within ECE Labs. This could be a possible privacy concern for the students in lab
  - Image data must be very secure

- Environmental
  - Data collection will be constant, need to optimize for power usage to minimize environmental impact
  - Manufacturing new cameras would increase the project's carbon footprint and its cost. We could possibly find old and unused cameras to use

User Needs

- We have identified three major user groups:

  - ISU ECE

    - Department needs a proprietary solution to lab tracking, in order to achieve their departmental goals of providing students with the tools they need to succeed

  - ECE Students

    - Dependent on labs in Coover Hall, need a way to see availability

  - ECE Professors

    - Need to provide as much assistance to students as possible, can use lab availability to schedule office hours or help hours
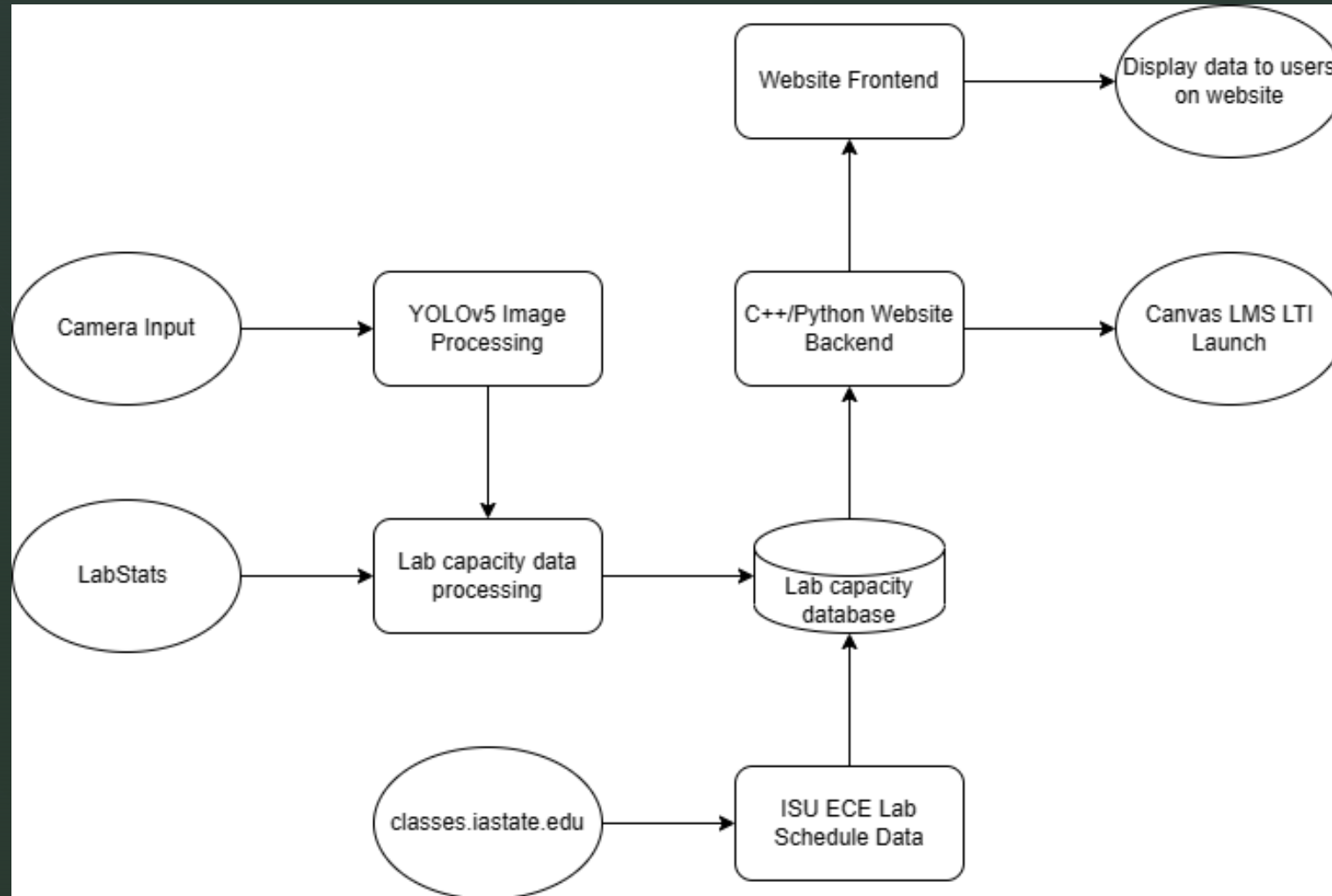
Prior Work & Solutions

- LabStats
  - Current lab tracking solution used by ECE
  - Can track only Windows PCs
  - Only tracks users logged into PCs. A desk could be filled by someone not on a lab PC

- Image processing
  - Our solution to supplement LabStats
  - Implement existing machine learning frameworks to identify students sitting at desks

Design Exploration

- How do we get accurate information?
  - Take info directly from servers
  - Use machine learning camera to supplement info from servers

- How do we display relevant information?
  - Create a GUI of each lab room that shows computers currently being used
  - Link classes to their respective lab rooms

- How do we make this information accessible?
  - Create user friendly website
  - Implement Canvas integration to show the website within a class's Canvas page, similar to Piazza

Proposed Design

Design Analysis

- Current design uses LabStats for lab occupancy

  - Costs a flat fee per device for service

- Ideal design replaces paid service with machine learning approach

  - Costs less per lab room

Thanks For Listening!

Questions?