EE/CprE/SE 491 - sddec23-10

Developing a Deep Learning Model to Automatically Detect Microscale Objects in Images and Videos

Week 2-4 Report

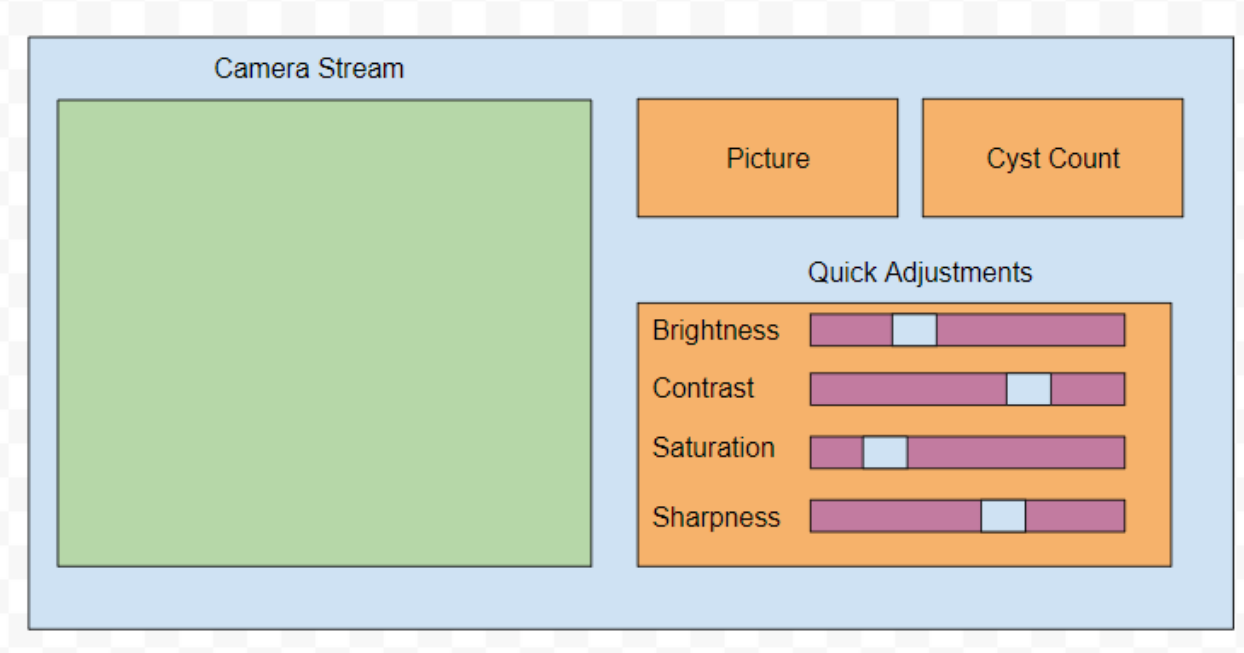
09/16/2023 – 09/27/2023
Client: Professor. Santosh Pandey
Group number: 10

Team Members:

Katherine Moretina
Ethan Baranowski
Chris Cannon
Matthew Kim

Hardware and GUI

- GUI Interface Changes
    - Things to take out
        - Zoom ROI
            - Lense has zoom options and quality decreases with digital zoom
        - LED/Flash mode
            - Not compatible with camera
        - Video options
            - Not compatible with machine learning model
        - Might just copy over CameraOutputStream.py and “Quick adjustments” feature
    - Things to add
        - Cyst Count



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- Figuring out how to easily find get cyst count from downloaded model
- Buy 2 battery packs, mouse, and keyboard for physical setup

Software

- Discovered algorithm implementation's file system uses 1 common json file. This means we will need to consolidate our dataset into a similar file system for ease of use.
- Testing detectron 2 model on the Google colab environment.
- Tried to transfer google colab code into VS code, but figured out the original version uses google colab library, openCV2.
- Things to test:
    - Just try on, train, on the google colab environment and deploy.
    - Try transferring into vs code version then figure out deploying.
    - If not works, try implementing cv library manually then try deploy.
- Figure out how to deploy on the PI environment.

Individual Contributions

Member	Tasks Completed	Hours This	Total

		Week	Hours
Katherine Moretina	• Setup camera on Raspberry Pi • Found open source GUI to take code from • Created plan for GUI	6	16
Matthew Kim	• Make Sure Google Colab environment does not have any error or issue. • Try to transfer the code to the VS code. • Research on CV2 library. • Research on how to deploy on to the Pi environment.	4	8
Chris Cannon	• Created script to consolidate labelme image data • Created python function to serve data to detectron2 • Reviewed research of others	6	10
Ethan Baranowski	• Researched ways to swap datasets to test the algorithm's implementation compatibility. • Discovered custom dataset use causing complications. • Attempted, unsuccessfully, to create a custom version of the dataset that mirrored the implementation's.	6	11

Plans for Coming Week

- Research different open-source GUIs to develop upon
- Download code onto Raspberry Pi to explore more capabilities
- Finish script to transform LabelMe data into the correct format for Detectron