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CS5600 Final Project Proposal

Proposal

I plan to use YOLOv8 to identify landmarks in face images, such as eye center locations and nose tip location. I will then use this data to apply big cartoon eyes, a clown nose, and a smile to the person in the image. This will somewhat replicate the behavior of popular face filter apps like Snapchat.

Resources

I plan to use the image dataset "Face Images with Marked Landmark Points" found at this link: https://www.kaggle.com/datasets/drgilermo/face-images-with-marked-landmark-points/data. This dataset contains 7049 facial images with 15 key points marked on each one. Data points describe eyes, eyebrows, nose, and mouth. I will face a few problems with this dataset. The first problem I will face is that the data is in csv form instead of the form YOLO expects. Before writing this proposal, I wrote a script that can transform this data from csv form into the form that YOLO expects to ensure that this project would actually be possible. The second problem I will face is that some images in the dataset are missing one or more data points. Because I need to use nearly all the data points from the original data to create bounding boxes, I will remove any images that do not contain all 15 labels. This brings the number of usable images down to about 2400. Because I have solved these two main problems that I was able to identify, I feel confident about using this dataset. I will be working on a PC with an RTX 3070 gpu, so I should have the computation power to complete this project.

Deliverables

I will deliver a program that will, given an input image of a person, output that image with cartoon eyes, a clown nose, and a smile. I will submit my source code and trained models to a github repo, along with a 4 page report on the process and results.

Dependencies

I plan on containerizing my project within docker so that dependency management is abstracted away from the user. I think this project will be a good opportunity for me to sharpen some of my docker skills. I will also present instructions for manually installing dependencies and running the project in case there are any problems with docker.

Schedule

Deadlines:

Monday, 11/18 – Finish scripts that convert data into YOLO format and get all images/labels saved in train and validation folders.

Friday, 11/22 - Get YOLO running on the dataset and get a baseline reading for performance.

Monday, 12/2 – Finish hyperparameter tuning and training on YOLO model. Save model.

Friday, 12/6 – Write a user interface for the tool where the user can upload pictures and see the output. Write code that puts images on top of the face image.

Monday, 12/9 – Finish containerizing and testing project.

Tuesday, 12/10 – Finish writing project report and submit.

Risks

One of the biggest risks I will face in this project is my time. My wife has a lot of health problems and over the next 4 weeks I will spend 2-4 days in Salt Lake City at doctor's appointments with her. I am also going on a cruise over the week of Thanksgiving and will not be able to work on the project at all that week. That gives me about 2 ½ weeks to finish this project. I feel like I have kept the scope of this project at a place that is realistic for me to finish in this time.