Journal Report 6
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Daily Log

Monday October 7

Found the OpenPose Tutorial for the Python API: https://github.com/CMU-Perceptual-Computing-Lab/openpose/tree/master/examples/tutorial_api_python. The eighth and ninth python files here (heatmap from image and keypoints from heatmap) were most useful in determining how OpenPose works in detail. Also looked at the C++ API and researched whether there is a significant enough change in runtime to warrant using C++ instead of Python. There doesn't seem to be so I'll probably just keep using Python.

Tuesday October 8

Determined best way to generate input samples. Plan on concatenating the normalized heatmap, which indicates where different joints are and the probabilities they are there and the subset array which indicates which limbs were found in the image. The normalized heatmap should automatically account for distance between joints, though that could become an additional feature if I did some more pre-processing. One thing that I'm not sure about here is how to take into account multiple people, which joints are theirs as opposed to others in the image, and how to determine who's violent and who's not a priori. OpenPose provides a list of the candidates of different people in each image but doesn't indicate which joints are theirs as opposed to others explicitly, so maybe I could modify their code to do that in some way. Additionally, changing dimensions in the number of limbs could mess things up potentially, so I need to think of how to account for that.

Thursday October 10

Started writing code that runs OpenPose across all existing frames and generates a dataset of poses marked as either violent or non-violent. Didn't finish writing the code so will continue doing that next week. Also participated in the People's Ramen Party.

Timeline

Date	Goal	Met
Today minus 2 weeks	Run pre-processing code to decompose surveillance feed into individual frames marked as violent or non-violent through entire dataset.	Completed
Today minus 1 week	Review OpenPose code and determine best statistical representation for poses.	Completed
Today	Run OpenPose code through dataset of frames marked as violent or non-violent.	Still in progress.
Today plus 1 week	Write code that loads new dataset, preprocesses it, and gets it ready as input data for the neural network	
Today plus 2 weeks	Run neural network, refine model.	

Reflection

I feel like by moving on to writing the code and stopping researching I'm leaving a number of loose ends, particularly on the question of how to determine which people are bystanders in a frame vs engaged in the violent action. Maybe so kind of mechanism that determines change in pose over time could be useful? Maybe that would also be better input data for the model? I might come back to these questions if my model seems wrong and try and refine my approach further. Though I have been researching for a couple of weeks now, I feel like I'm coming closer to an architecture that best fits my goal.