EE 435 Project Proposal: Real-time Speed Detection from Visual Feed
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Introduction:

Currently, basic object detection enables users to understand higher-level abstractions of images but however limits the user's perception. In contrast to just displaying labeled info and not other relevant details, our project will explore a scenario based on a dashcam video, for use-case in the field of self-driving cars and navigation.

Using state-of-the-art convolutional architectures, we map and predict the velocity of vehicles from the visual feed of camera. This goes beyond simply labeling of animal and people images, and would require developing and training on video data, providing real-time analytics.

Architecture and Scope:

- The general model for this project would be using CNNs on images captured from video frames, with tools like OpticalFlow.
- We are using video files from the comma.ai GitHub repository.
- An extension would be to develop DNNs upon Caffe and employ tools like OpenCV for real-time utility.
- Harnessing support of Nvidia's end-to-end architectures upon PyTorch we will map the values with pre-trained weights and generate scores.

- Proposed Tool(s): Caffe, Torch, CNNs, Single-shot MultiBox detectors, OpenCV

Deliverables:

1. A tabulated report/summary with plots and prediction scores, supplemented with final-video renders of the model for the testing video.
2. Jupyter notebook and .py files to run and implement the code.
3. A YT video of the screencast of our model in action, with audio summary.

> Please kindly mention if there are any suggestions or changes to be made, we have a few more ideas in the field of Computer Vision and would to discuss more in person.
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