Deep Learning With Computer Vision

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Overview

- Background
  - CARTA Passenger Detection and Counting
  - Pre-trained general deep learning models evaluated on CARTA videos

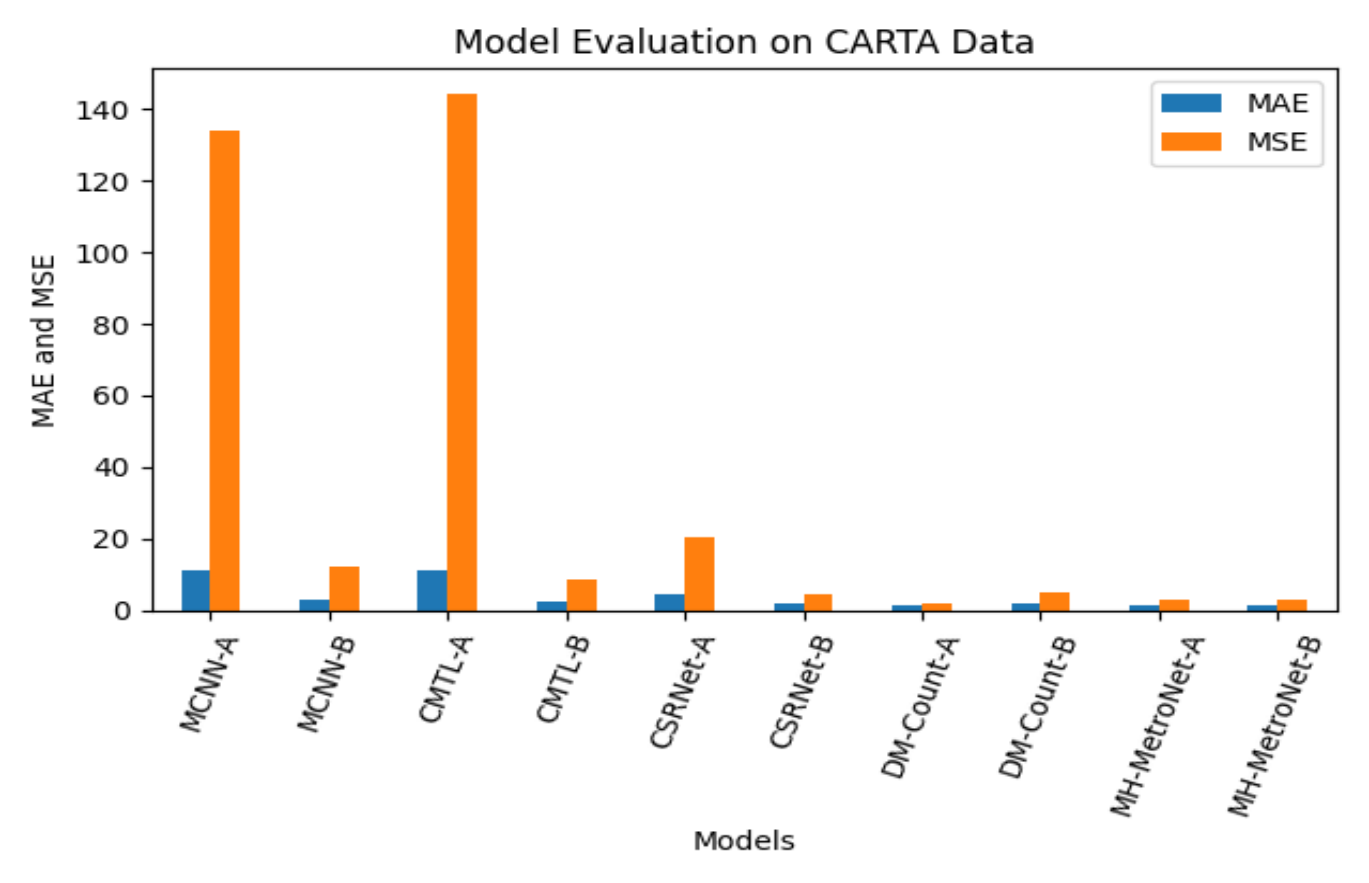
- Objectives
  - Evaluate state of the art deep learning models for crowd counting on CARTA videos
  - Label images with more attributes to train new model

Crowd Counting

- Video download from CARTA server using RDP
- Image extraction for labelling purpose(Python)
- Ground truth annotation(CVAT)
- Density map generation using gaussian convolution(MATLAB)
- Training state of the art open source crowd-counting models on SHHA and SHHB dataset(Google Colab NVIDIA K80)
- Testing and evaluation of those models

Model Comparison

- Mean Absolute Errors and Mean Squared Error for number of people detected



Labelling

- Labels with more attributes for better feature recognition mapping with passengers
- Attribute and annotation guideline generation
- CARTA Bus videos (approx. 1500 images)
  - Point Annotations
  - Box Annotations

Conclusion

- Challenges:
  - Minimal experience with Python, and Deep Learning, and CV going into the internship
  - Adjusting to a remote setting

- Positives:
  - Experience with Deep Learning models, CV, Python, MATLAB
  - Lecture series
  - Prof. Dubey and the team were firm but really helpful regarding the project goal as well

Thank you to Vanderbilt ISIS and Professor Dubey for the opportunity to participate in this work this summer

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