Application Control Using Hand Gestures

Team Information

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Data Set

https://www.kaggle.com/aryarishabh/hand-gesture-recognition-dataset

Project Idea and Description

We want to detect different hand gestures and use them to control various applications on the computer, such as changing the volume, changing slides, etc.

Our high-level approach for solving this problem is as follows:
- Train a CNN model on the training data from Kaggle
- Verify the accuracy of different model architectures
- Collect data real-time from our webcams
- Extract hand gestures from real-time video frames using background elimination techniques
- Predict hand gestures using our model
- [Stretch goal]: Control an application such as PowerPoint using model prediction on hand gestures performed in real-time

References

- YOLO
- Single Shot MultiBox Detector
- Fast R-CNN

Tentative Roles

- Anmol
  - Handle any kind of data pre-processing required
  - Train CNN
  - Work on application control [stretch goal]
- Jayam
  - Train CNN
  - Explore different CNN architectures that we can make use of
  - Handle prediction and usage of model for application
- Rounak
  - Train CNN
  - Collect real-time data from the webcam
  - Apply different background elimination technique

HPC

We would like to access the high-performance computing system as some of the larger CNN models can take a while to train.