

E9 246 (Advanced Image Processing) Final Project Proposal (Winter 2022)

March 17, 2022

1 Project Goal

We will be developing an object detection mobile app. A user will capture an image and we will detect the number of same type of objects in the given image. Additionally, we will extract explainable features from the image. We will be focusing on own of the following applications of this app depending on the availability of training data and other resources:

- Coin counting: Many currencies have metal coins. Its difficult to count coins manually and still most of the shopkeepers do it manually. We will be developing an app for coin counting. The user will provide an image of the coins and we will give him a final count of the money.
- Crowd counting: For a user provided image, we will count the number of human faces in it. It will be useful in crowd tracking

1.1 Algorithm development

The primary task of the app would be object detection Following are the existing algorithms for object detection:

- Fast RCNN
- Faster RCNN
- RFCN
- Single shot detector
- YOLO (You Only Look Once)

In the initial phase of project, we will review these existing algorithms to understand their pros and cons for crowd counting problem and then will chose one algorithm to proceed with.

1.2 Android app development

We will use Pytorch [PGM⁺19] Mobile/Tensorflow lite and Android studio for the app development

1.3 Team

- Sangeeta Yadav (PhD, CDS)
- Arijit Dey (MTech (SP), EE)

References

- [PGM⁺19] Adam Paszke, Sam Gross, Francisco Massa, Adam Lerer, James Bradbury, Gregory Chanan, Trevor Killeen, Zeming Lin, Natalia Gimelshein, Luca Antiga, Alban Desmaison, Andreas Kopf, Edward Yang, Zachary DeVito, Martin Raison, Alykhan Tejani, Sasank Chilamkurthy, Benoit Steiner, Lu Fang, Junjie Bai, and Soumith Chintala. Pytorch: An imperative style, high-performance deep learning library. In H. Wallach, H. Larochelle, A. Beygelzimer, F. d'Alché-Buc, E. Fox, and R. Garnett, editors, *Advances in Neural Information Processing Systems 32*, pages 8024–8035. Curran Associates, Inc., 2019.