

# 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 faces in the given image hence it can be used for crowd counting. Additionally, we will extract explainable features from the image. The goal of the project is to develop an end-to-end pipeline for face categorization in an android app.

### 1.1 Algorithm development

Following are existing algorithms for object detection:

- Fast RCNN
- Foster RCNN
- RFCN
- Single shot detector

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 Dataset

We will use FUDAN-UCC(2022) [GHL<sup>+</sup>22] dataset, it has 4000 samples images of resolution 612\*448. It is an unlabeled dataset.

### 1.3 Android app development

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

### 1.4 Team

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

## References

- [GHL<sup>+</sup>22] Jiaqi Gao, Zhizhong Huang, Yiming Lei, James Z. Wang, Fei-Yue Wang, and Junping Zhang. S<sup>2</sup>fpr: Crowd counting via self-supervised coarse to fine feature pyramid ranking, 2022.

- [PGM<sup>+</sup>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.