**DL Project Write-up**

**Facial key point detector**

**Abstract**

The objective of this task is to predict keypoint positions on face images. This can be used as a building block in several applications

**Design**

Data comes from a Kaggle program, links are as follows:

<https://www.kaggle.com/competitions/facial-keypoints-detection>

I firstly built a full connection model, then built a cnn model and finally use this cnn model as benchmark to build a transfer learning model

I also tried a ResNet50 version

**Data**

Data comes from a Kaggle program, links are as follows:

<https://www.kaggle.com/competitions/facial-keypoints-detection/data>

Each predicted keypoint is specified by an (x,y) real-valued pair in the space of pixel indices. There are 15 keypoints, which represent the following elements of the face:

left\_eye\_center, right\_eye\_center, left\_eye\_inner\_corner, left\_eye\_outer\_corner, right\_eye\_inner\_corner, right\_eye\_outer\_corner, left\_eyebrow\_inner\_end, left\_eyebrow\_outer\_end, right\_eyebrow\_inner\_end, right\_eyebrow\_outer\_end, nose\_tip, mouth\_left\_corner, mouth\_right\_corner, mouth\_center\_top\_lip, mouth\_center\_bottom\_lip

**training.csv** list of training 7049 images. Each row contains the (x,y) coordinates for 15 keypoints, and image data as row-ordered list of pixels.

testing. cvs list of testing 1783 test images. Each row contains image Id and image data as row-ordered list of pixels

**Algorithms**

* Full connected model👉CNN👉transfer learning based on CNN, separating the data into 6 groups but each group use the same CNN learning method
* Pre-trained ResNet50

**Tools**

* Keras
  + MaxPooling2D, Conv2D , Flatten, Dropout
  + BatchNormalization
  + EarlyStopping, ReduceLROnPlateau
  + ResNet50
* Matplotlib
* Sklearn
  + Shuffle
  + train\_test\_split
* Numpy &Pandas

OrderDict

**Communication**

In addition to the slides and visuals presented, will be embedded on my personal website and blog.