# Video Timestamp Generator

**Problem Statement:** To create chapters feature to YouTube videos to make things easier for content creators and viewers.

**Issue to be addressed:** Currently creators are supposed to manually add the chapters on a particular timestamp to each video at the time of uploading.

**Solution expected:** Implement Machine learning/deep learning to recognize text in video in order to auto generate video chapters. Chapters break up the video into sections, each with an individual preview. These chapters could help viewers by giving more info and context by allowing them to re-watch different parts of the video.

**Technical Solution Expected:** First timestamp listed in the video description should start at 0:00, and that the video has at least 3 timestamps or chapters, with each chapter being 10 seconds or longer.

**Benefit of the Solution:** Make it easier for creators to add chapters to their lengthy videos as well as let viewers navigate to a particular chapter they are interested in watching. The feature should allow creators to break up videos into sections with their own individual previews. Viewers can then skip straight to the segment they want to watch.

**Sample Technical Approach Expected:**

YouTube V3 API to search downloads the videos associated with the name of the shows/channel we specified. [Search for the ID of up to 50 videos (limited by the API) given the playlist ID.]

FFMPEG is leveraged to split videos into frames, each of which are processed by a self-trained Mask-RCNN to keep only the subtitle area of the image.

The processed images are sent to Google Vision API for obtaining the predicted text and confidence.

With Pandas library, sort the results by timestamp

**Model Evaluation: (Example)**

Model Architecture - Input layer, Embedding layer,L2 normalisation layer, Embedding aggregator, Concatenate layer,ReLU and Batch Norm Layers, Dense output layer, Loss function, Train and Predict, Visualize Embedding's.

**Expected Accuracy of the Model:** 60 to 70% (Number of Epochs, Dataset and other factors will be considered)

**Minimum Prerequisite for technology/framework stack:**

Python==3.6 or above

FFMPEG

joblib==0.12.0

numpy==1.13.3

pandas==0.23.3

tensorflow-gpu==1.4.0 or 2.0

keras==2.1.3

google-cloud-vision==0.32.0

pafy==0.5.4

youtube-dl==2017.12.2

tqdm==4.23.4

editdistance==0.4

OpenCV

Skimage

Linux Ubuntu

**Example Business Solution**: https://farotech.com/yt/