Spring 2020: Embedded System Laboratory Semester Project

Fire and smoke classification with Keras and Deep Learning

This is group activity. You are supposed to develop convolutional neural network architecture that will classify fire, smoke and non-fire/smoke images. Initially project will be developed on google colab. Localization of fire/smoke will be additional point. Performance of model will be based on data collection, data preprocessing, evaluation matrix and graphs of your model.

Details of Project:

Step 1: Preparing our Fire and Non-fire combined dataset

Step 2: Implementing fire detection Convolutional Neural Network

Step 3: Creating our training script

Our training script will be responsible for:

- Loading our Fire and Non-fire combined dataset from disk.
- Instantiating our FireDetectionNet architecture.
- Finding our optimal learning rate by using our LearningRateFinder class.
- Taking the optimal learning rate and training our network for the full set of epochs

Step 4: Training the fire detection model with Keras

Training our fire detection model is broken down into three steps:

Step 5: Making predictions on fire/non-fire images

Given our trained fire detection model, let's now learn how to:

- Load the trained model from disk.
- Sample random images from our dataset.
- Classify each input image using our model.

Step 6: Fire detection results