Zero deforestation mission

Fikabusters Team

Approach

- Use both text and image features as input for the classification
    - Latitude, longitude and year
    - Image categories like topographic features, presence or absence of agriculture, and small deforest areas
- For the text attributes, select the classifier that has the highest prediction accuracy (30% of the training dataset is used for the accuracy evaluation)
- For the image attributes, apply computer vision techniques to the dataset images and use them in a neural network

Key ideas discussed

- Data Augmentation
  - Randomly rotating, flipping, changing brightness creates new images based on labeled training dataset images that can be used to train the model
  - Another way is to find other datasets (such as [PASTIS](#)), but low availability of correctly labeled datasets made it hard to implement
- Combination of the text and image classifiers
  - If we use text classification first and then image classification, a good approach is to first check how confident each classifier is of its prediction and decide based on that
  - A better idea would be to use all the features at the same time for classification (combined by concatenation, element-wise multiplication…) and get only one predicted label

Implementation

Data Preparation	Text Based Classification	Image Based Classification	Combined Label Selection
Load and preprocess the datasets using pandas.	Use a Radial Basis Function (RBF) kernel SVM Classifier to label the test data by looking at the text features using scikit libraries.	Use a Convolutional Neural Network (CNN) to label the test data by looking at the image features with Torch.	Compare the classifiers' confidence in each of the labelling decisions and pick the label with the highest confidence.

Summary: We were able to implement the text-based classifier with an accuracy ~67% using the split training dataset. However, the image-based classifier which current accuracy is ~54% requires implementation with some of the key ideas stated in the previous slide to achieve a higher accuracy, and to be combined with the text-based classifier for an improved overall prediction.