Namal Institute Mianwali

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Soil analysis using machine learning

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1 Problem Statement

Pakistan economy relies heavily on agriculture [1].Every farmer wants to get more crop yield but due to lack of knowledge in soil study,they are unable to get desire result.So the study of soil is quite necessary to get more crop yield.There is only option available for farmers to test their soils in the laboratory.But laboratory testing for soil is quite time consuming process and it also costs a lot which average farmer cannot afford.So farmer uses different fertilizers without knowing insights of soil,in a result they over-fertilize their crops or under-fertilize which heavily affect the crop yield.

2 Proposed Solution

The use of latest technology for soil analysis which will be time efficient and budget friendly.For this project, we are proposing that hyper-spectral imaging will be used for soil analysis. Hyper-spectral sensor will be installed on drone which will fly over the target land and will capture the data. Captured data will be available on android application and will passed to deployed machine learning models on amazon web services(AWS) platform.Machine learning models will use the captured data as input. In a result, machine learning models will predict different macro-nutrients in soil.Android application will get results from machine learning models to generate report and recommend fertilizer.

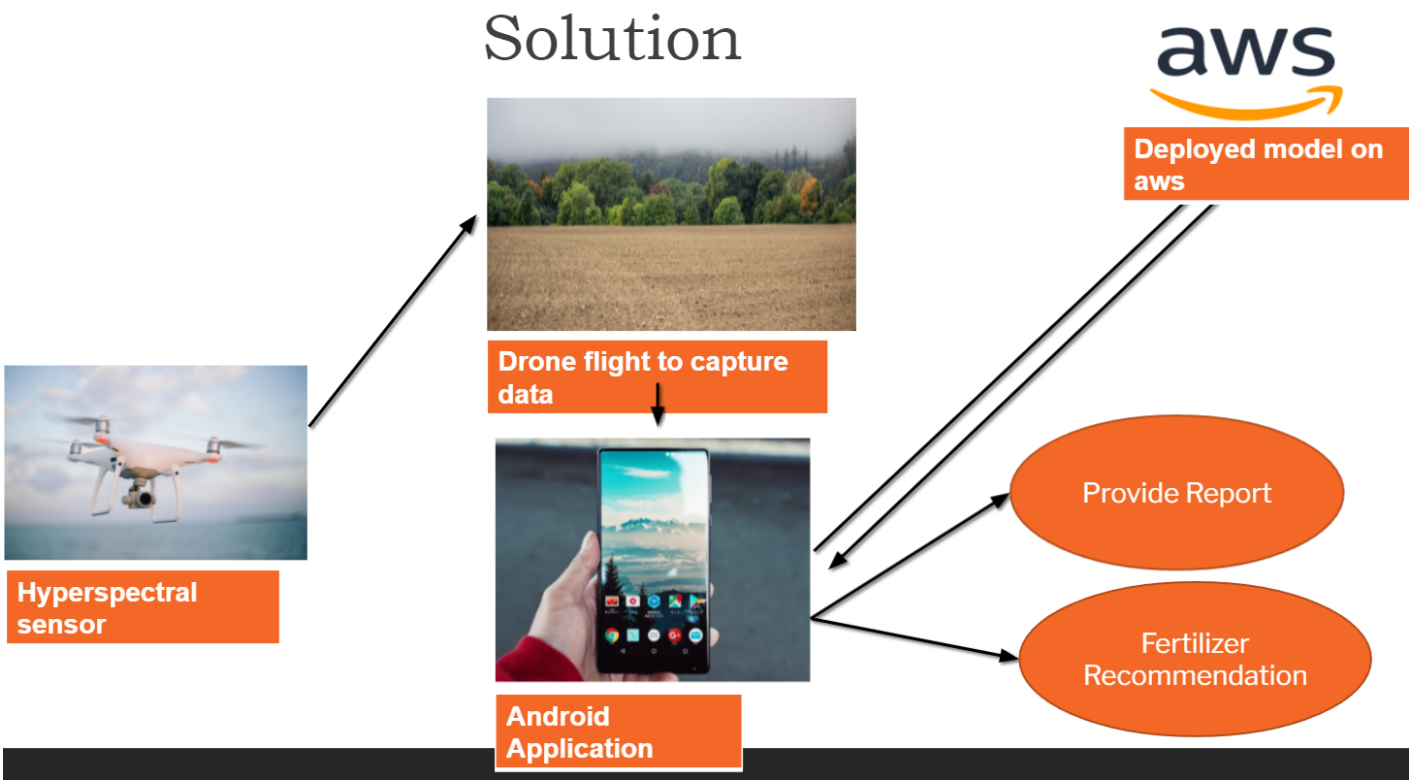

Figure 1: Proposed Solution

3 Methodologies

- Data Gathering
- Pre-Processing
- Literature review for feature extraction
- Selecting machine learning models according to features
- Training and testing
- Android Application Development
- Evaluation of different models
- Exhaustive comparison of different machine learning models

4 Project Timeline

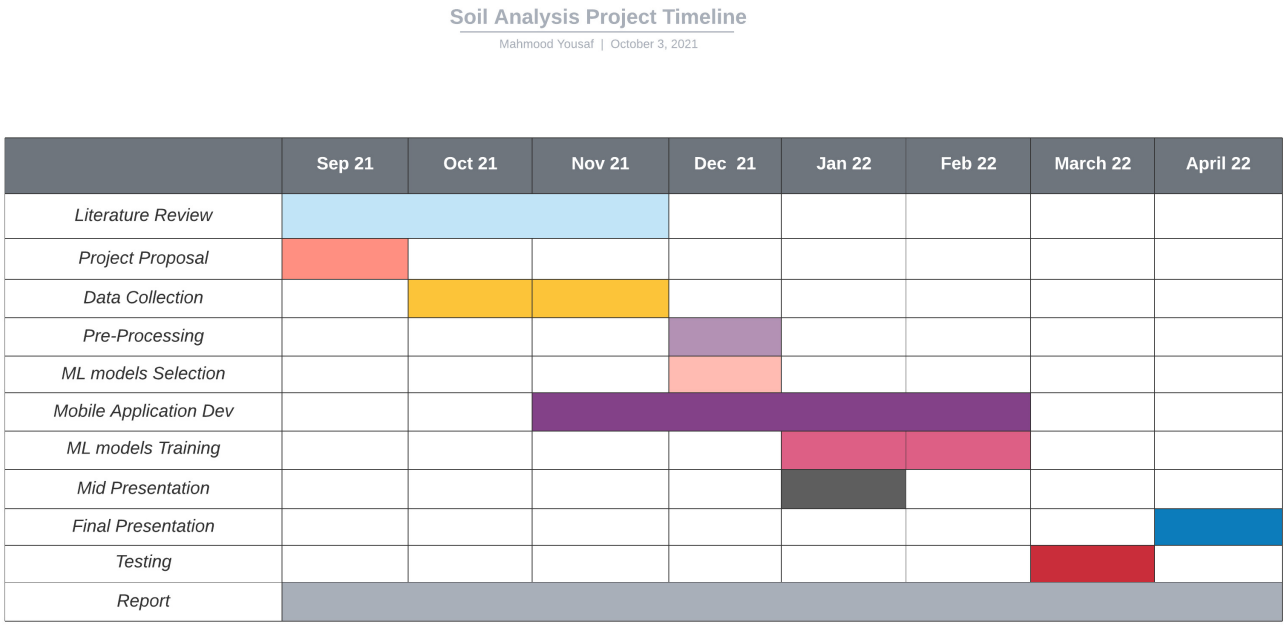

Figure 2: Project Timeline

References

[1] Wikipedia contributors. Agriculture in pakistan — Wikipedia, the free encyclopedia, 2021. [Online; accessed 1-October-2021].