

Machine Learning Fundamentals

ECE3047 (L57+L58)

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**Lab FAT**

**Aim**

Pick an application that interests you and explore how best to apply Machine learning algorithms to solve it. Public dataset can be used. Choose proper performance measure to validate the algorithm for the chosen application.

**Tools Required**

**Jupyter/VS Code**– Python Notebook Code Editor.

**Google Drive link**

<https://drive.google.com/drive/folders/12xizHa3DcdFedtNN47l380Gn1WpKNRdp?usp=sharing>

**Application**

Soil Moisture Prediction for Improved Irrigation using ML Algorithms

**Dataset**

Input – Humidity and Temperature values

Prediction – Soil Moisture Depletion Rate

**Abstract**

Moisture in soil gets absorbed and evaporated and their rate of evaporation will rely on several factors like atmospheric temperature and humidity. To avoid excess watering of fields, we can predict the expected soil moisture content by obtaining a relation between soil moisture and temperature, pressure.

Soil moisture is one of the main factors in agricultural production and hydrological cycles. Existing prediction models have problems such as prediction accuracy, generalization, and multi-feature processing capability, and prediction performance must improve.

Based on this, the Machine learning regression network with big data fitting capability was proposed to construct a soil moisture prediction model. By integrating the dataset, analysing the time series of the predictive variables, and clarifying the relationship between features and predictive variables through the Taylor diagram, selected meteorological parameters can provide effective weights for moisture prediction.

**Conclusion**

Successfully picked **“Soil Moisture Prediction for Improved Irrigation using ML Algorithms”** and experimented on multiple prediction algorithms available to ensure maximum accuracy and minimum RMSE values, which I consider as appropriate performance measures to validate the algorithm (as the predicted value variation would lead to intensive damage to the crops, hence error margin should be minimal at all costs). The dataset used was publicly available.