Algorithmic Machine Learning Project

Topic: Image Depth Regression Analysis

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Project Objective:

1. Perform EDA on the dataset to understand the image data set.
2. Extract, pre-process and clean the image data.
3. Apply Machine learning algorithms – KNN, Linear Regression, Ridge, Ridge CV, Neural Nets.
4. Analyze the performance of each model and propose the best working model

Dataset Description:

The dataset consists of two image files in the NP format. One file consists of RGB files with 3 dimensions or axis, and another file consist of Depth images with 1 dimension or axis.

Data Cleaning & Pre-Processing:

1. **Extracting the image dataset from NP array** – This includes loading of data from NPZ file and storing them into two separate variables

2. **Normalization** – This step scales the data set and helps in better performance and to converge faster.

3. **Transpose** – This would permute the axis of the array and will return an modified or transposed array.

4. **Shuffling** – This would shuffle both the image datasets for RGB and Depth so that random training and testing is carried out.

Machine Learning Models Implemented:

1. Linear Regression
2. Ridge Regression
3. Ridge CV
4. Neural Nets
5. Random Forest Regressor
6. Decision Tree Regressor
7. Multioutput Lasso

Member Contribution:

No	Activity	Member
1	EDA	Neeraj, Anirudh, Vipul
2	Data Cleaning & Pre-Processing	Neeraj, Anirudh, Vipul
3	Implementation of KNN, Random Forest Model, Linear Regression, RBF SVR	Vipul
4	Implementation of Ridge & Ridge CV Model, Neural Nets, Multioutput Lasso, Linear SVR	Neeraj
5	Implementation of Neural Nets, CNN, Decision Tree, KNN convolved	Anirudh