Estimating the Photometric Redshifts of Galaxies Using Regression Techniques

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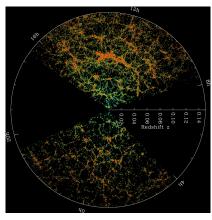
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July 7, 2021

Overview

- Introduction
 - Motivation
 - Spectroscopic and Photometric Redshifts
 - Machine Learning
- Methodology
 - Data Preprocessing
 - Desicion Tree Algorithm
 - Random Forest Algorithm
 - Validation
- Literature Survey
- Results and Disscusion

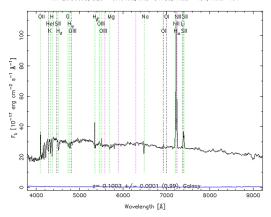




SDSS Galaxy Map

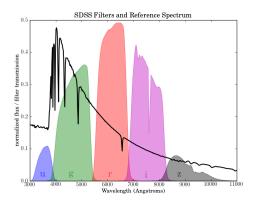
- Possibility of Obtaining a Spectrum
- Sophisticated ML Algorithm
- Dark Energy and Dark Matter

RA=25.53003, DEC=-0.49495, MJD=51788, Plate= 401, Fiber=161



$$\lambda_{obs} = (1+z)\lambda_{em} \tag{1}$$





$$u = m_{\text{ref}} - 2.5 \log 10 \left[\int_0^\infty F(\lambda) S(\lambda) d\lambda \right]$$
 (2)



Decision Tree

Decision trees map a set of input features to their corresponding output targets. This is done through a series of individual decisions where each decision represents a node (or branching) of the tree.

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Random Forest

Random forests are an ensemble learning method for classification, regression and other tasks that operates by constructing a multitude of decision trees at training time.

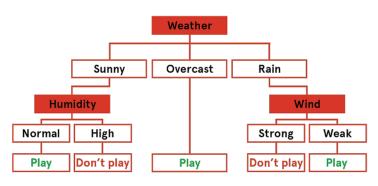


Figure 1: Schematic View of Decision Tree

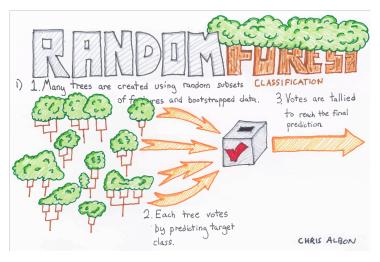


Figure 2: Schematic View of Random Forest

Thanks For Your Attention :)