Effectiveness of Calculating the Redshift of Quasars Photometrically

Tarunno, Mohd (School: Upper Darby High School)

The purpose of this research was to determine the effectiveness of photometric methods in predicting redshift values of Quasars. Photometric magnitudes from the SDSS SkyServer was gathered and used in four different methods, Regression, Grid, Query, and Machine Learning, to check for the effectiveness of each. The regression method hoped to find a correlation between photometric magnitudes and redshift through a linear and quadratic equation while the grid method focussed on graphing and predicting redshift values through their specific location within each plot. The Query method was initially considered as a stand alone method but was further added on as an added benefit of the Machine Learning method to get better predictions. The results of this project determined that regression models and the grid method are equally beneficial in predicting the redshift value of Quasars in specific situations. And that the combined use of both could prove to be the best tool at gathering redshift values at the most efficient rate. Not to mention, the Query and Machine Learning methods are highly effective if used in unison and serve as the best known method at predicting redshift values in real-time.

Awards Won: