

Abstract Submitted
for the MAS21 Meeting of
The American Physical Society

Using a Neural Network Classifier to Select Galaxies with the Most Accurate Photometric Redshifts ADAM BROUSSARD, ERIC GAWISER, Rutgers University — The Vera C. Rubin Observatory Legacy Survey of Space and Time (LSST) will produce several billion photometric redshifts (photo- z 's), enabling cosmological analyses that use subsets of galaxies with the most accurate photo- z 's. We perform initial redshift fits on Subaru Strategic Program galaxies with imaging in *grizy* optical and near-infrared bands using Trees for Photo-Z (TPZ) before applying a custom neural network classifier (NNC) tuned to select galaxies with accurate photo- z 's. We consider four cases of training and test sets ranging from an idealized case to using data augmentation to increase the representation of dim galaxies in the training set. We find significant further improvements when selecting galaxies using the NNC over selections made using TPZ uncertainties, including a 35% improvement in outlier rate and a 23% improvement in photo- z scatter (σ_z). This method can be tuned to retain a particular sample size or to achieve a desired photo- z accuracy; our results show that it is possible to retain more than a third of an LSST-like galaxy sample while reducing σ_z by a factor of two compared to the full sample, with one-fifth as many photo- z outliers.

Adam Broussard
Rutgers University

Date submitted: 05 Nov 2021

Electronic form version 1.4