

MACHINE LEARNING



FOR PHYSICAL SCIENCES LAB

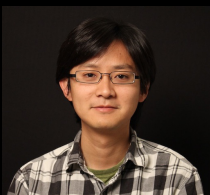
No previous machine learning experience required.

Requirements: Physics 1A,1B,1C, Math 32A, 33A, Python knowledge is helpful

Components: Lectures (2 hr), Labs (4 hrs) per week, final ML project, no exams

Topics Include:

Probability theory, Naive Bayes
Classification, regression
Support Vector Machines
Decision Trees and Random Forest
Issues in training models
(hyperparameters, missing data, etc.)
Principle component analysis
Dimensionality reduction
Clustering and mixture models
Gaussian Processes



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LEARNING OBJECTIVES



Become familiar with the vocabulary and methods of machine learning



Can approach a problem in physics or astronomy and decide if machine learning will be useful and what type of machine learning can be used.



Develop experience in the compilation, analysis, and cleaning of data from astronomy and physics contexts



Develop and have access to a community of machine learning practitioners and learners.