Statistical Learning
- Course Syllabus -

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2021-2022

Lecture 0 - Requirements: Tidyverse

Tidyverse:
- Core Tidyverse
- Wrangle (tidyr & dplyr)
- Program (purrr)

R Code Evaluation Methods:
- Standard Evaluation
- Non-Standard Evaluation
- Tidy Evaluation

Pipe Operator:
- Basic Piping
- Argument Placeholder
- Re-using Placeholder for Attributes

Lecture 1: Tidymodels

Recipe:
- feature engineering
- steps
- recipes

Parsnip:
- engines
- modelling
- workflows

Rsample:
- sampling
- validation
- cross-validation

Lecture 2: Machine Learning, Regression & Classification

Regression Algorithms:
- Linear Regression
- Ridge, LASSO, Elastic Net
- MARS

- SVM
- KNN
- Bagging
- Random Forest
- XGBoost, LightGBM, CatBoost
- Cubist
- Multi Layer Perceptron

Classification Algorithms:
- Naive Bayes
- Logistic Regression
- Ridge, LASSO, Elastic Net
- SVM
- KNN
- CART
- Bagging
- Random Forest
- XGBoost, LightGBM, CatBoost
- Cubist
- Multi Layer Perceptron

Lecture 3: Hyperparameter Tuning

Tune:
- tuning
- grid searches
- validation

Lecture 4: Ensemble Learning & Stacking

Stacks:
- ensembling
- stacking
- elastic net stacking
- simple ensembles

Lecture 5: Automatic Machine Learning

H2O:
- H2O modelling
- AutoML
- Tidymodels integration, h2oparsnip

Lecture 6: Deep Neural Networks

Tensorflow

Keras:
- network structure
- activation functions
- backpropagation
- training

- evaluation
- tuning

Lecture 7: Explainable AI