Advanced Machine Learning with Tidymodels

A course that builds on the material covered in our Machine Learning with Tidymodels course. We take a look at how we can fit linear discriminant analysis (LDA) models using {discrim}, assessing model reliability using V-fold cross validation, pre-processing, tree-based models & more. If you wish to explore the abundance of model fitting techniques {tidymodels} has to offer, then this course is certainly for you!

Course Outline

- Qualitative modelling: An introduction to Linear Discriminant Analysis (LDA).
- Fitting LDA models & model prediction: Using {discrim} to add additional bindings to {parsnip}, to fit LDA models
- Advanced model assessment: V-fold cross validation using {workflows} and {tune}
- **Penalised regression techniques**: Ridge regression, lasso and elastic net
- Tree-Based Models: Bagging, random forests and boosting

Learning Outcomes

Session 1:

By the end of session 1, participants will be able to...

- understand and fit linear discriminant analysis models in the Tidymodels style using {discrim} and {parsnip}.
- use {yardstick} to assess models and gain an understanding of model metrics.
- understand V-fold cross validation and bootstrapping and how to use it on your training data.
- tune model hyperparameters in an intelligent fashion using the $\{tune\}$ and $\{dials\}$ packages.

Session 2:

By the end of session 2, participants will be able to...

- understand, create and tune penalised regression models and explore multiple metrics such as Ridge, Lasso and Elastic Net regression.
- understand variable importance and know how to use {vip} to assess variables.
- understand the concept of tree-based models and their uses in regression and classification.
- refine the performance of tree-based models by exploring ensembles: bagging, the {baguette} package, and random forest strategies.
- fit, tune and assess the predictive performance of tree-based models.

This course does not include:

- Other clustering alternatives to the K-nearest neighbours method.
- Dimensionality reduction methods except for linear discriminant analysis.
- Bayesian networks, neural networks and genetic algorithms.



- Computer Vision and Image recognition analysis.
- Boosting ensembles for tree-based models.

Attendee Feedback

• "Very well taught. I will certainly be recommending this course to my colleagues!"