

Hyperparameter tuning



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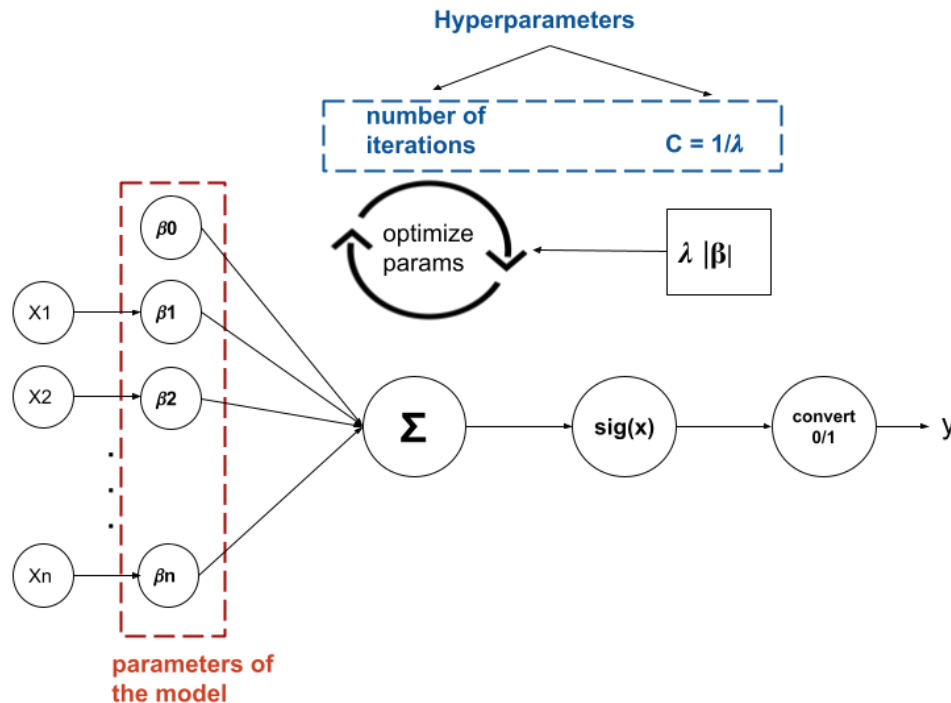
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Parameters and hyperparameters

Parameters: automatically estimated from data, part of the definition of parametric models.

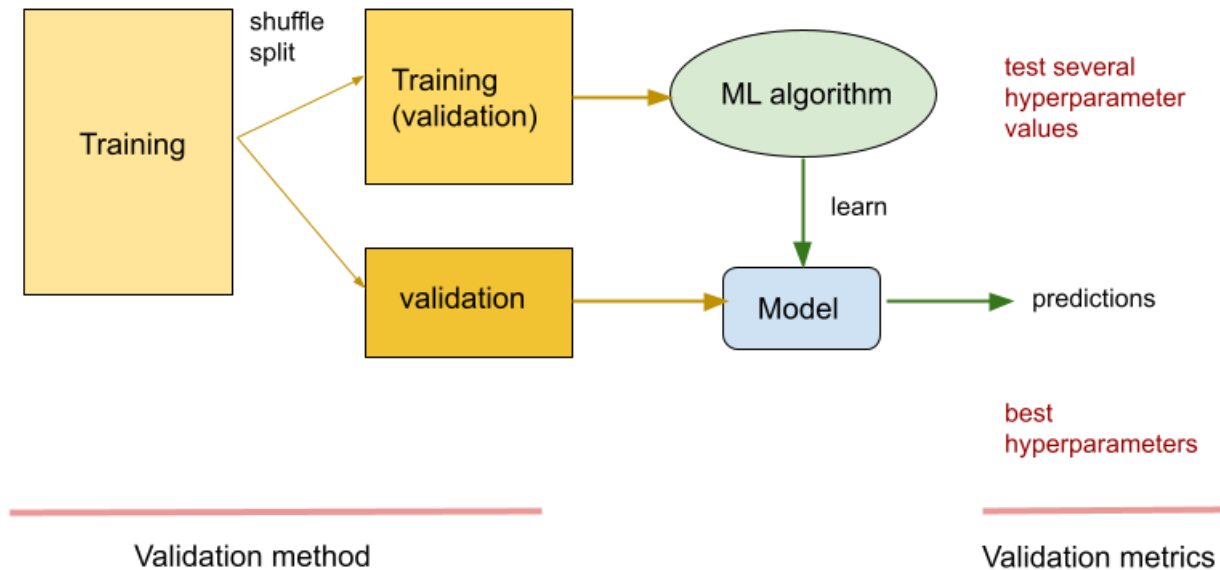
Hyperparameters: set manually, control the learning process, can be tuned. Some affect the performance of the model, some affect the speed o quality of the process.



Hyperparameter tuning

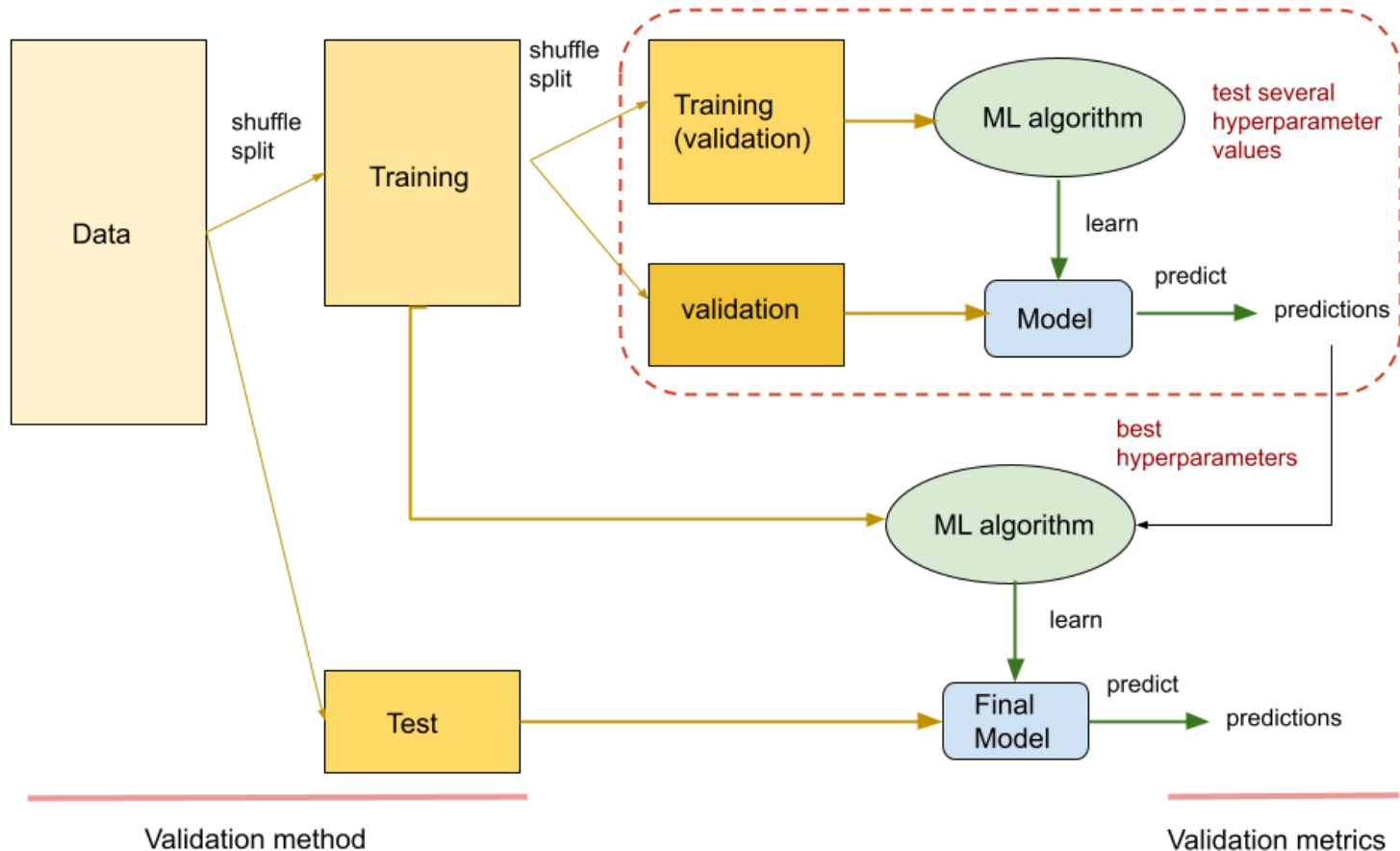
We want an **estimate of the performance** of models built with several hyperparameter values **on unseen data**.

Sounds familiar? We have already learnt how to estimate performance on unseen data: splitting data into training and test subsets*.



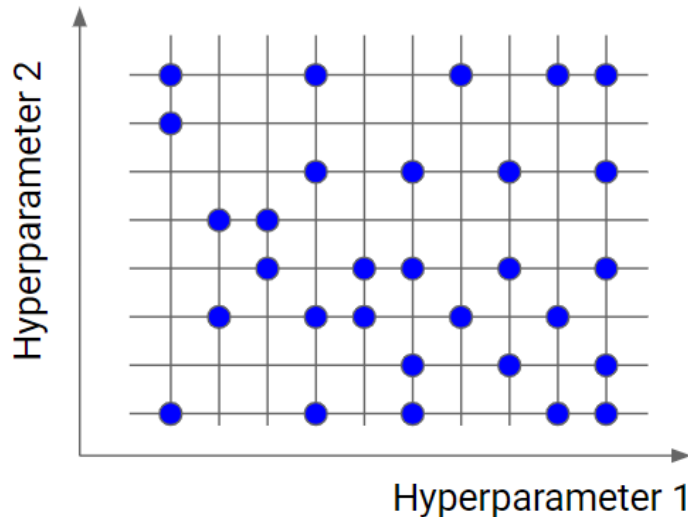
* In this example we use hold-out but we could also use k-fold CV.

Validation and hyperparameter tuning



GridSearchCV

Grid Search: Define an n-dimensional grid of hyperparameters and test every position of the grid.



[source](#)

`sklearn` provides `GridSearchCV` which evaluates the models created with each combination of hyperparameters using k-fold CV. We can indicate the evaluation metric to optimize.

