

Gird search

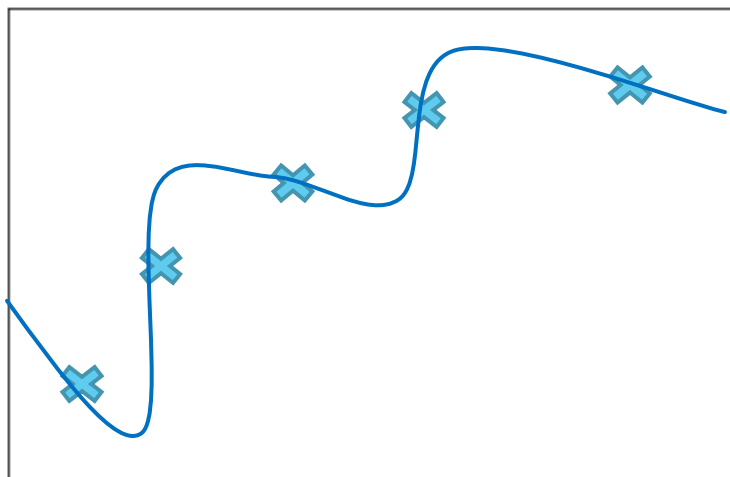
Advanced machine learning

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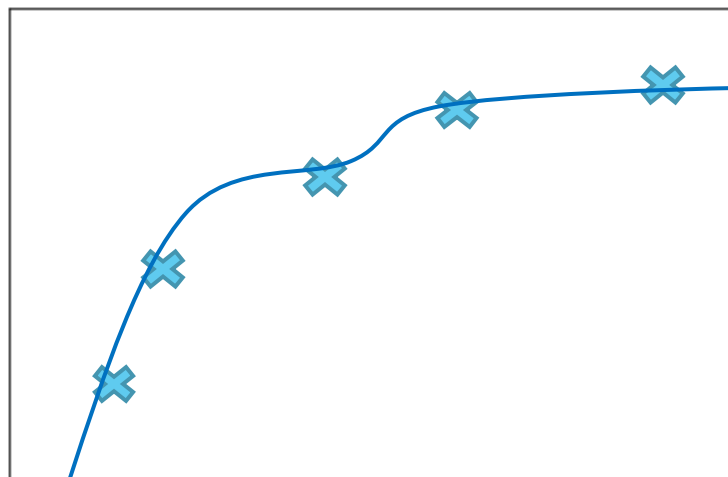


Impact of lambda on the cost function

$$J(w) = \frac{1}{2m} \left[\sum_{i=1}^m (h(x^{(i)}) - y^{(i)})^2 + \lambda \sum_{j=1}^n w_j^2 \right]$$



λ equal to 0 -> overfitting



Perfect value for λ -> good fitting



λ too large -> underfitting

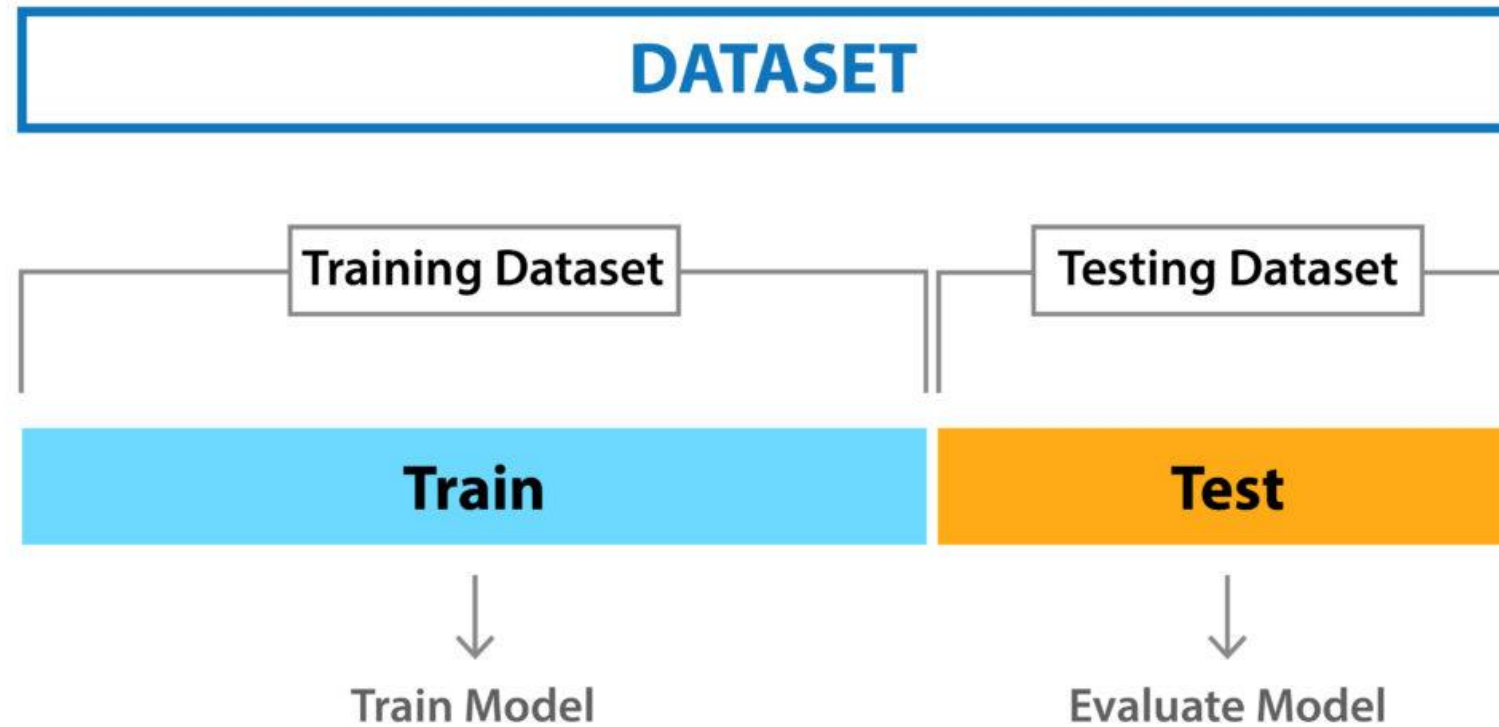
Use your Validation set



How to choose your hyperparameters

	Value for lambda	Performance on the training set	Performance on the validation set
Overfitting	0	100%	20%
	0.1	98%	40%
Good fitting	0.5	90%	70%
	0.7	89%	85%
	1	80%	75%
Underfitting	10	50%	45%
	100	0%	0%

Holdout cross-validation method



K-fold cross-validation method

Iteration 1	Test	Train	Train	Train	Train
Iteration 2	Train	Test	Train	Train	Train
Iteration 3	Train	Train	Test	Train	Train
Iteration 4	Train	Train	Train	Test	Train
Iteration 5	Train	Train	Train	Train	Test