Learning Rate

~ is a important Hyper parameter that determines how much a model adjusts its parameters in response to errors during training.

* a Model with a hight LR makes Large adjustments to its paramets after each Batch of Data, potentially learning Quickly, but risking over shooting optimal values
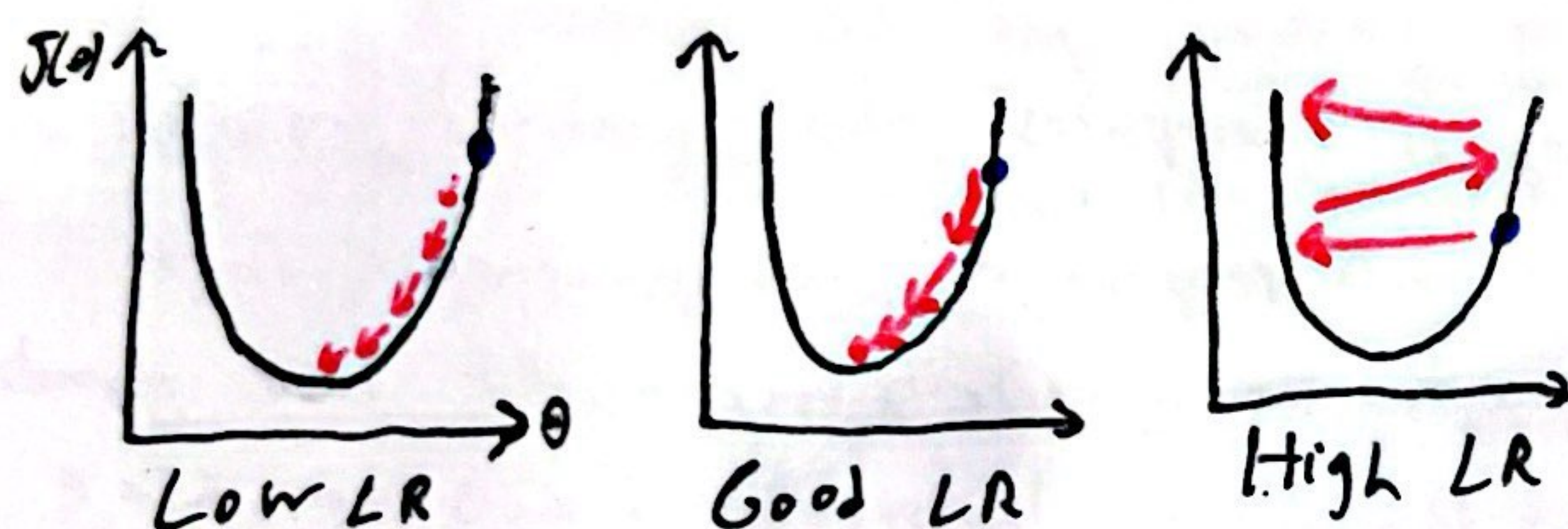
* a low LR means the model learns slower as it makes smaller cautious adjustments, this can be more stable but might take longer to converge or get stuck in suboptimal solutions

* finding the right LR is important.

Low LR   Good LR   High LR

Common LR values

Model type	Start value
Simple ML models	0.01 or 0.001
NN (basic)	0.001
CNN RNN, etc	0.001 or 0.0001
Transformer (Deep Nets)	0.0001
When using ADAM	0.001

* 0.1 → too high, Do trail and error

Evaluation

- is the process of Mesuring how well a ML model preforms on data is has not seen in traingng (test set) using metrics appropriate to task. But Evaluation typically involves Validation to tune model in training and testing using test set

Evaluation Metrics		
Regression	Classification	Clustring
R^2	Accuracy	Silhouette score
Adjusted R^2	Percision	Davies Bouldin index
MAE	Recall	Calinski-H index
MSE	F1-score	
RMSE	ROC-AUC	

* how to think of Evaluation for Validation vs testing

ALL Data

→ training   Validation   test

Model learns task

which model and hyper parameters are the best

How Good is this Model truly

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