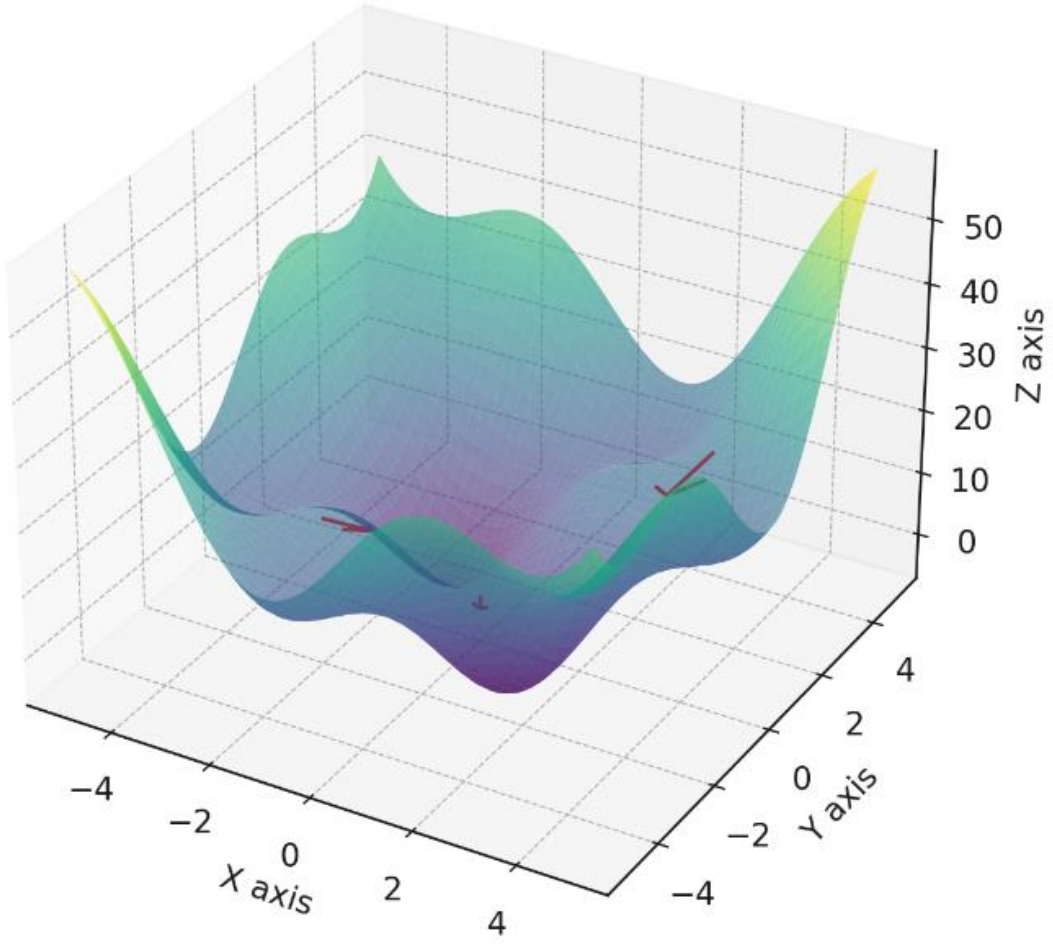
How to Tune Your Models

Module 3 Objectives

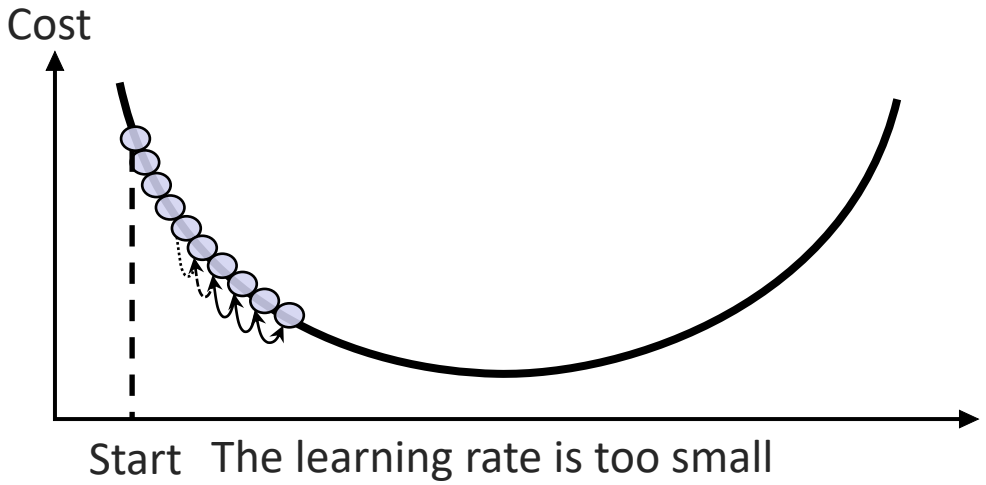
1. Describe the purpose and process of gradient descent.
2. Discuss the error loss function.
3. Describe optimizers.
4. Adjust a model's hyperparameters to guide its performance.

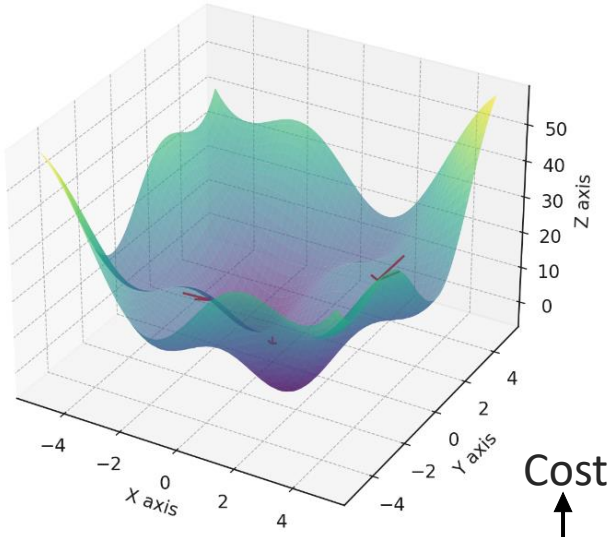
Understanding Gradient Descent

It’s All Downhill From Here



This image was generated using AI tools





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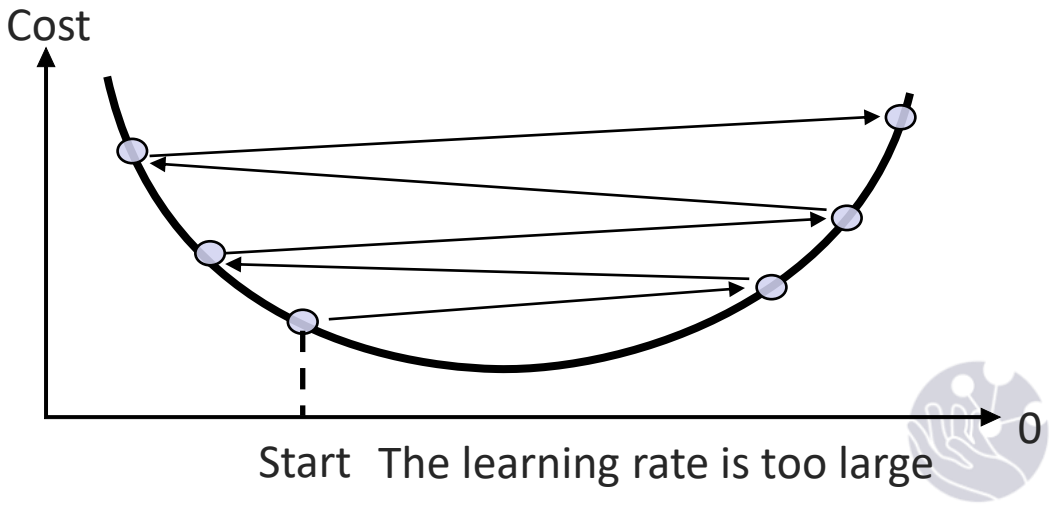
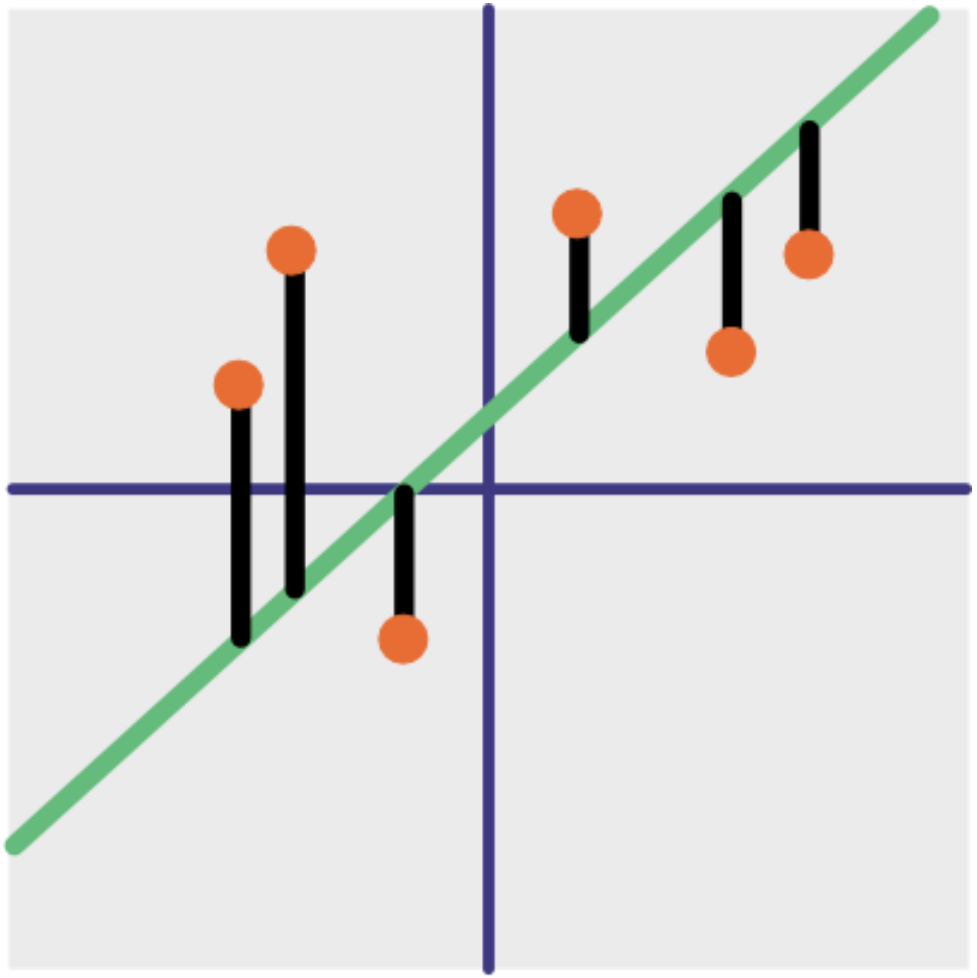


Introduction to Error and Loss Functions

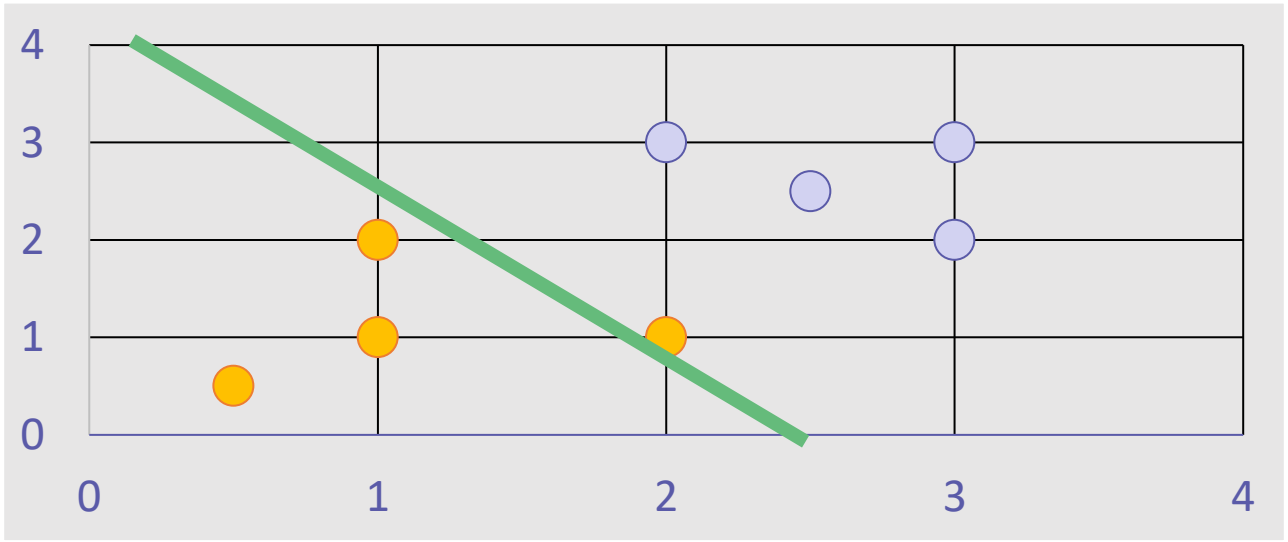
Loss Functions

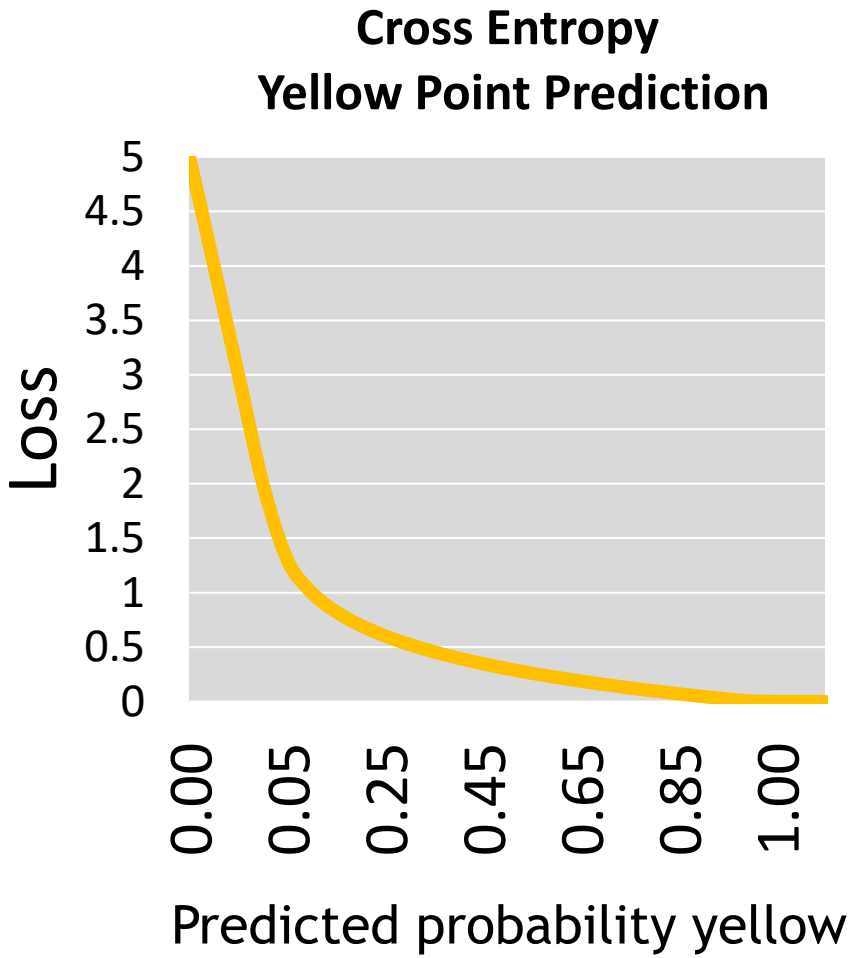
How do we quantify prediction error?

Mean Squared Error (MSE)

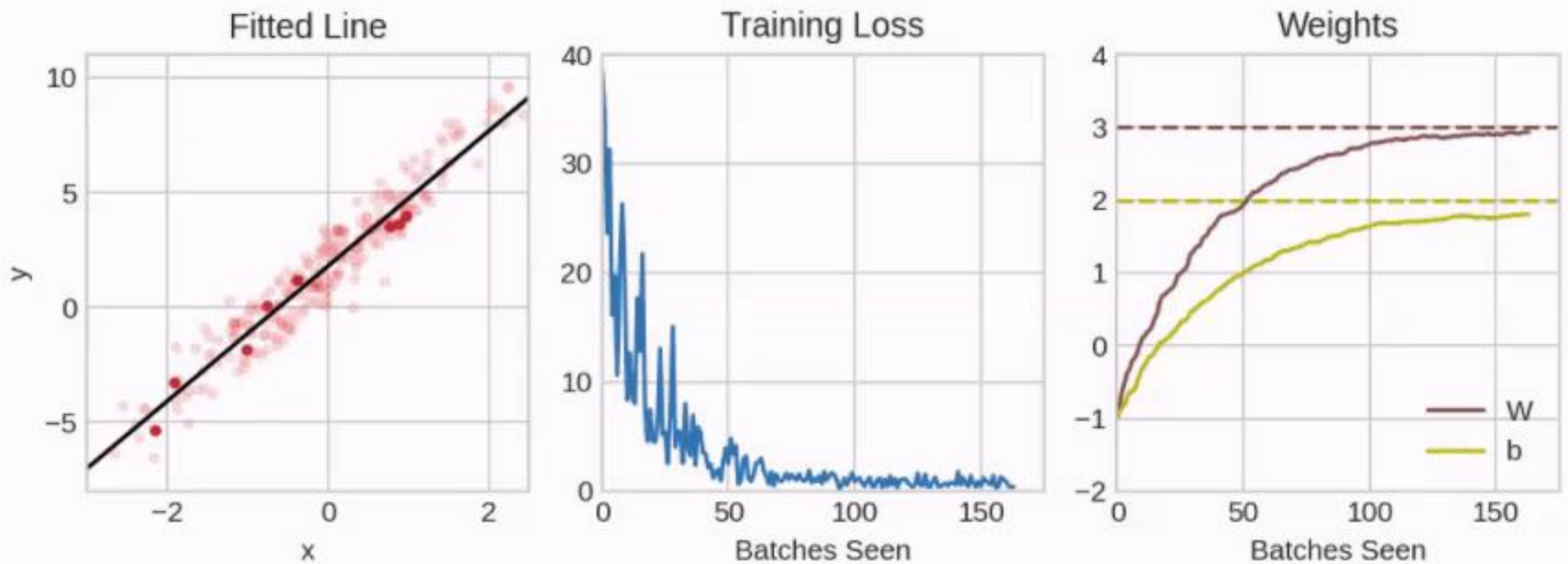


Cross Entropy

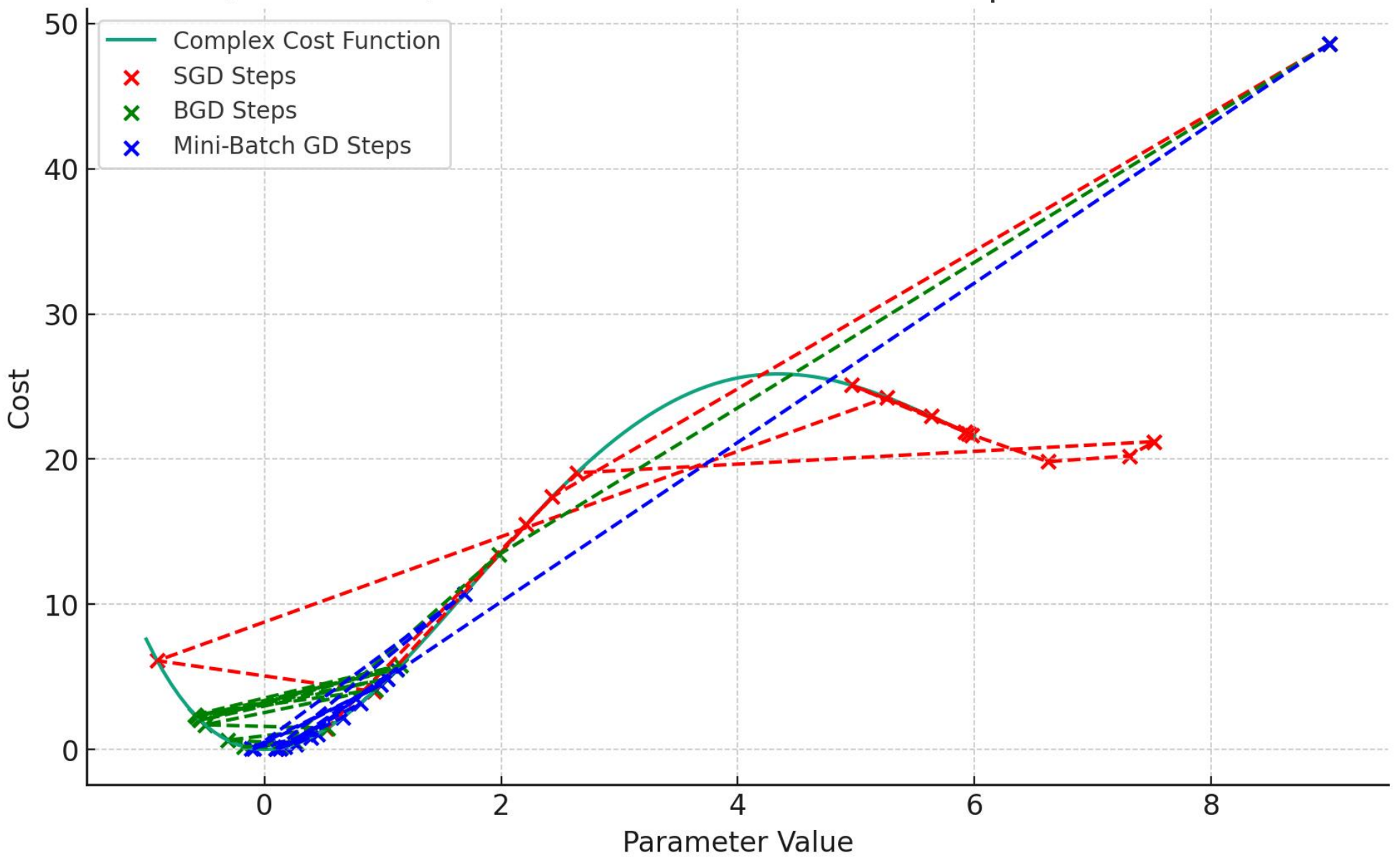




Optimizers & Advanced Gradient Descent Techniques



Training a neural network with Stochastic Gradient Descent.



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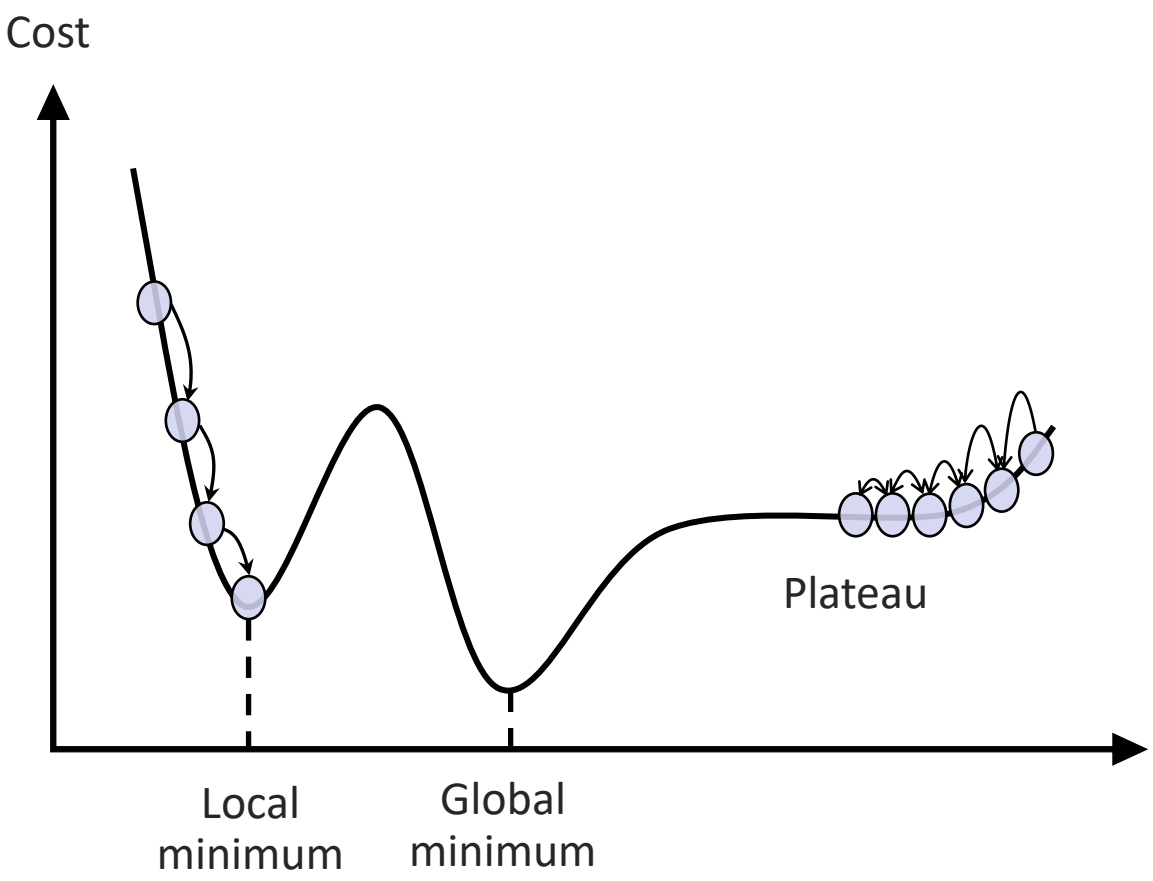
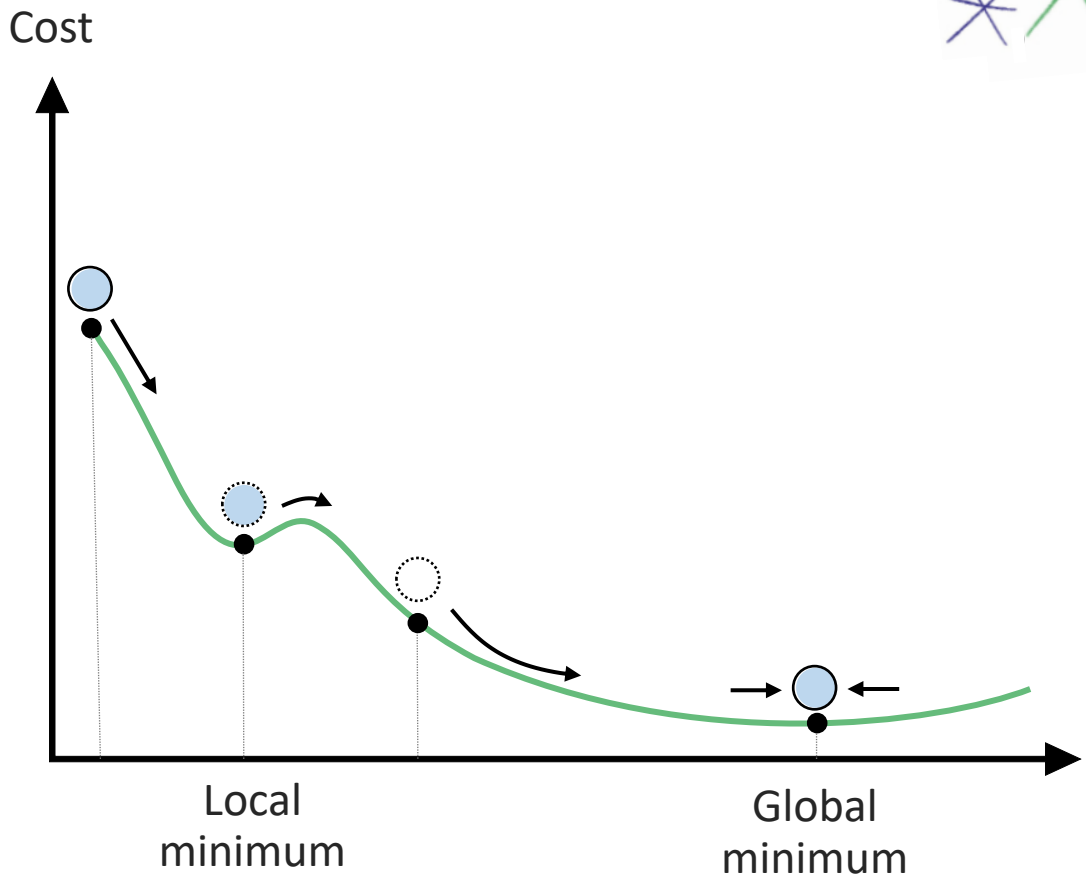
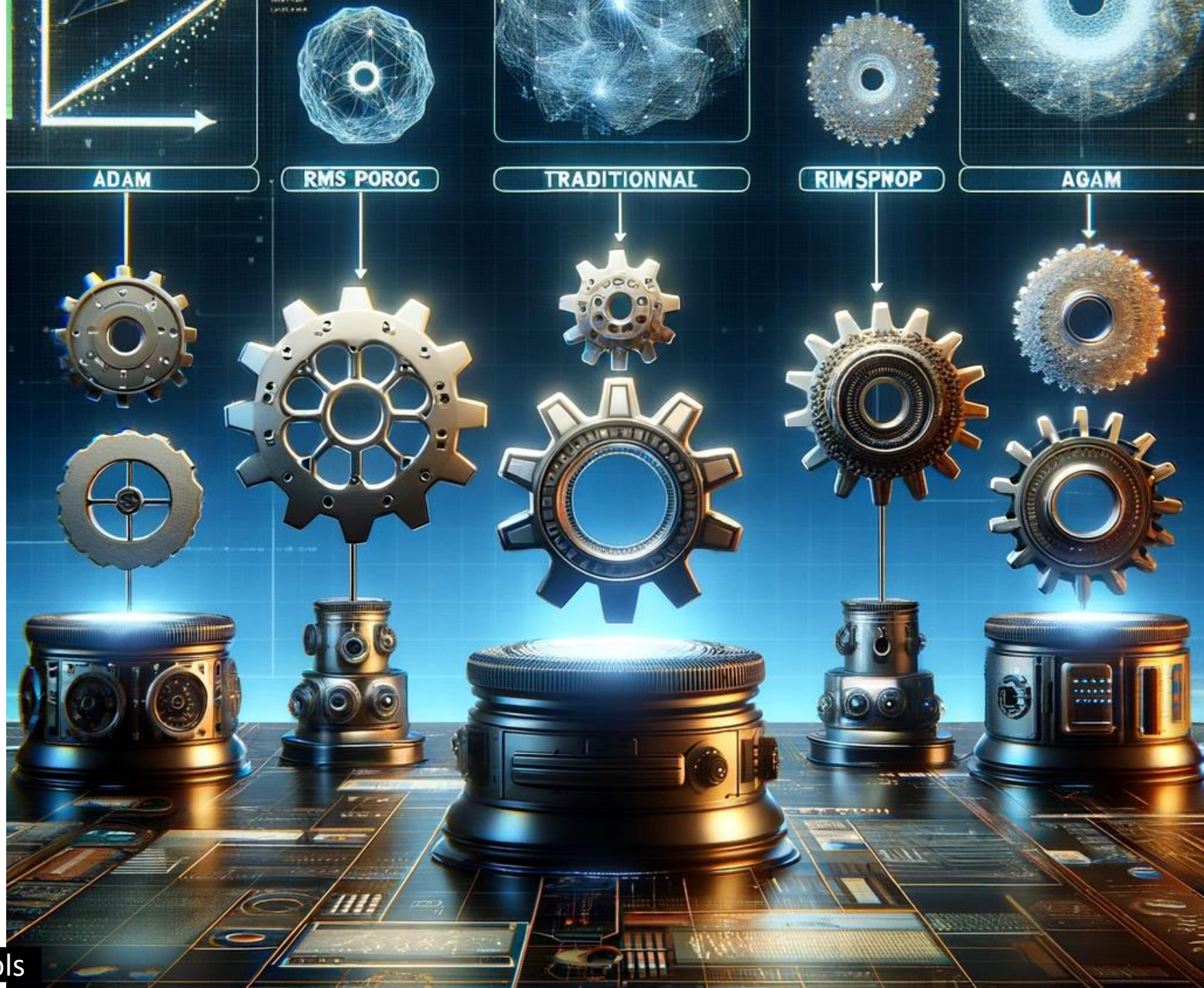

Cost
Plateau
Local
minimum
Global
minimum


Cost
Local
minimum
Global
minimum

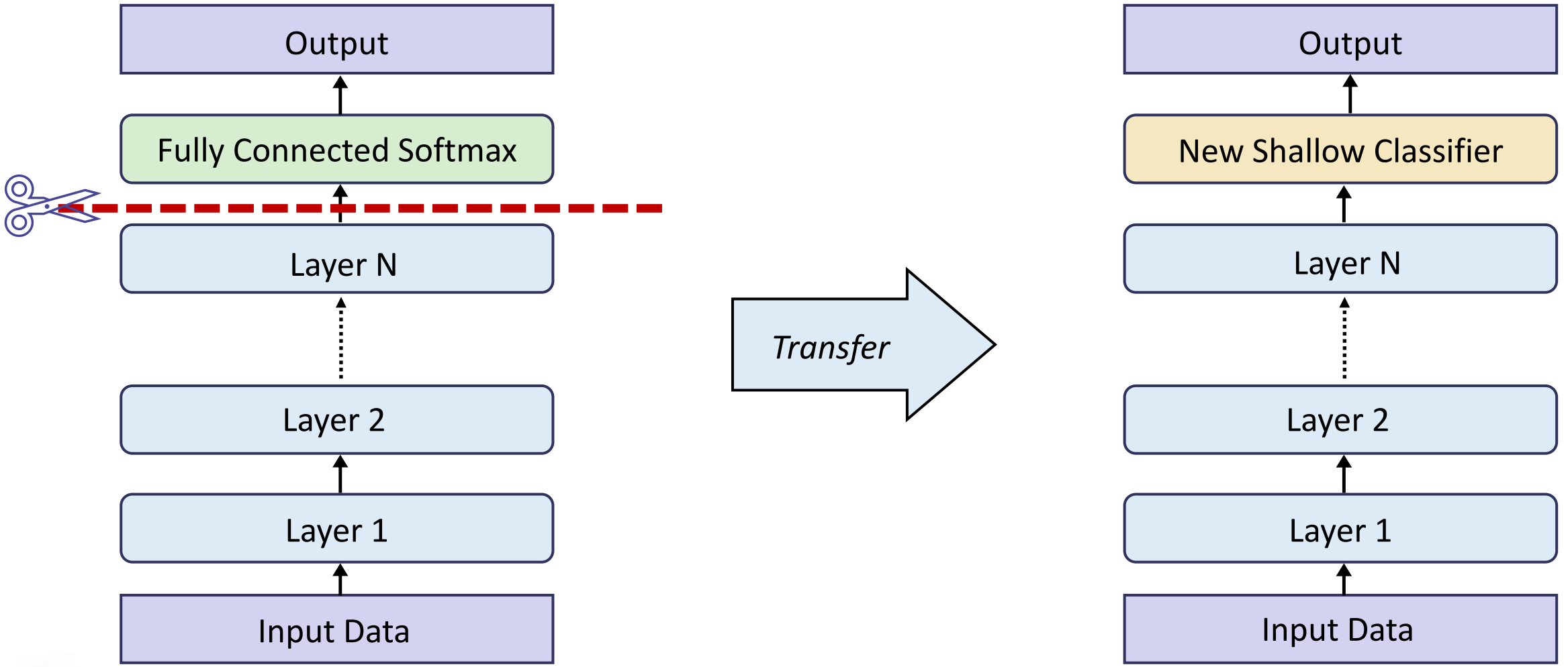
Choosing the Right Optimizer: A Quick Guide



This Image Was Generated Using AI Tools

Transfer Learning & Fine Tuning

We Can Also Use What We've "Learned"



Source: Sarkar, D, et al. (2018). *Hands-on transfer learning with Python.* Birmingham, UK: Packt Publishing. (Chapter 4)

Hyperparameter Optimization

04_bees_vs_wasps.ipynb

This notebook will walk you through building and training your own image classification model, then allow you to compare different hyperparameter optimization configurations!

Questions?

(QR CODE FOR SURVEY!)