



How to Tune Your Models





# Module 3 Objectives

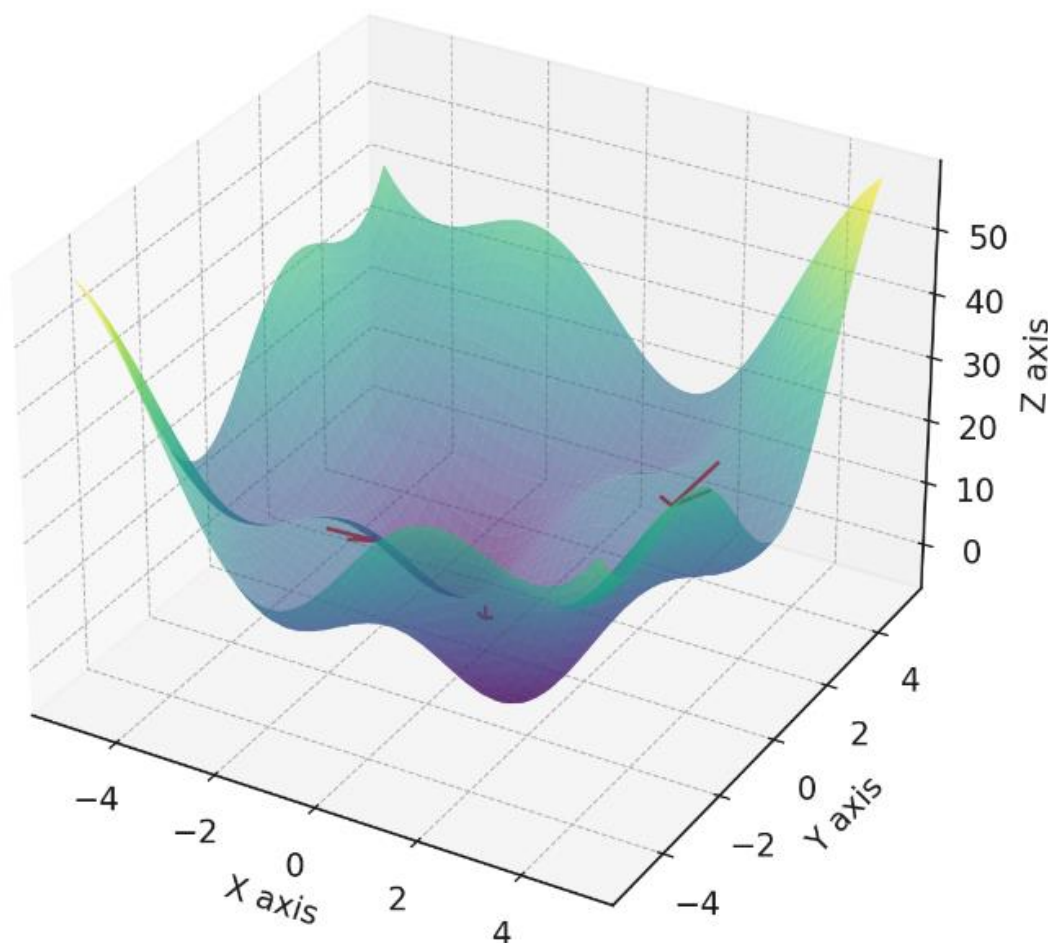
1. Describe the purpose and process of gradient descent.
2. Discuss the error loss function.
3. Describe optimizers.
4. Adjust a model's hyperparameters to guide its performance.



# Understanding Gradient Descent

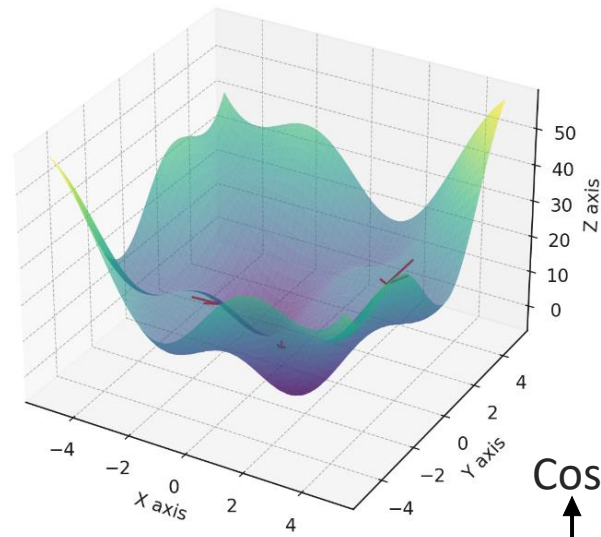
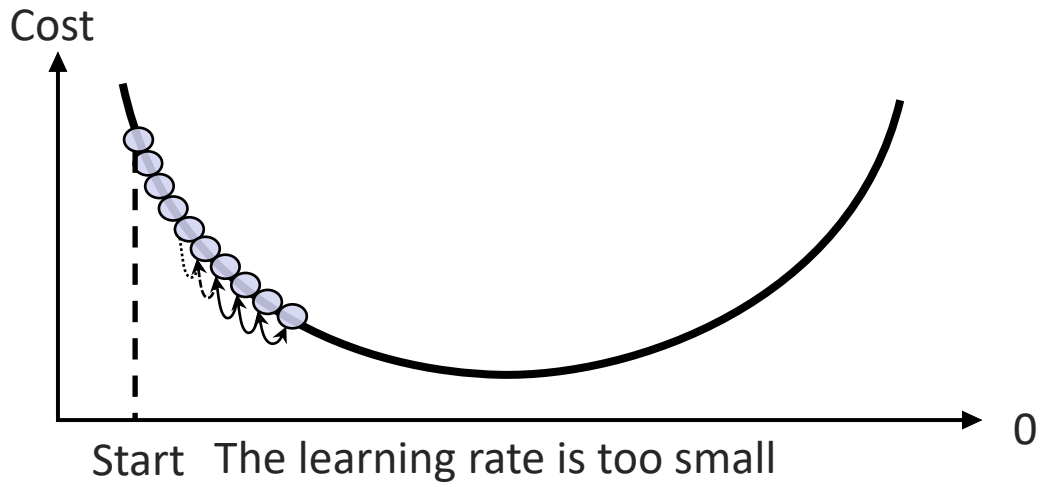


# It's All Downhill From Here

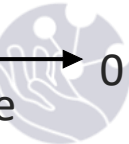
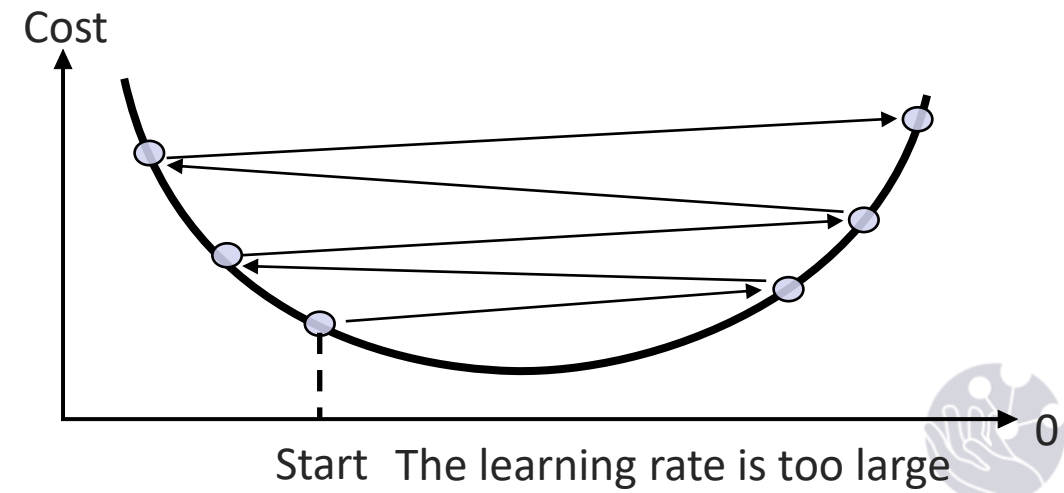


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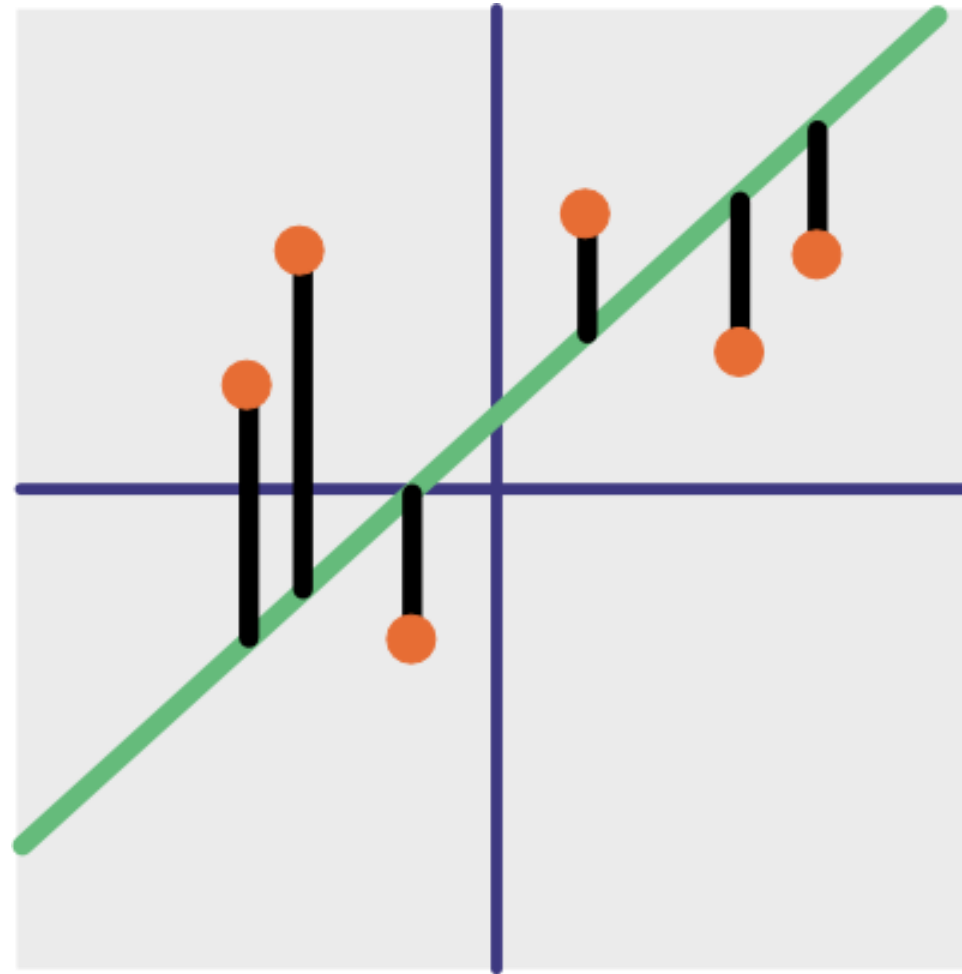
# Introduction to Error and Loss Functions

# Loss Functions

How do we quantify prediction error?

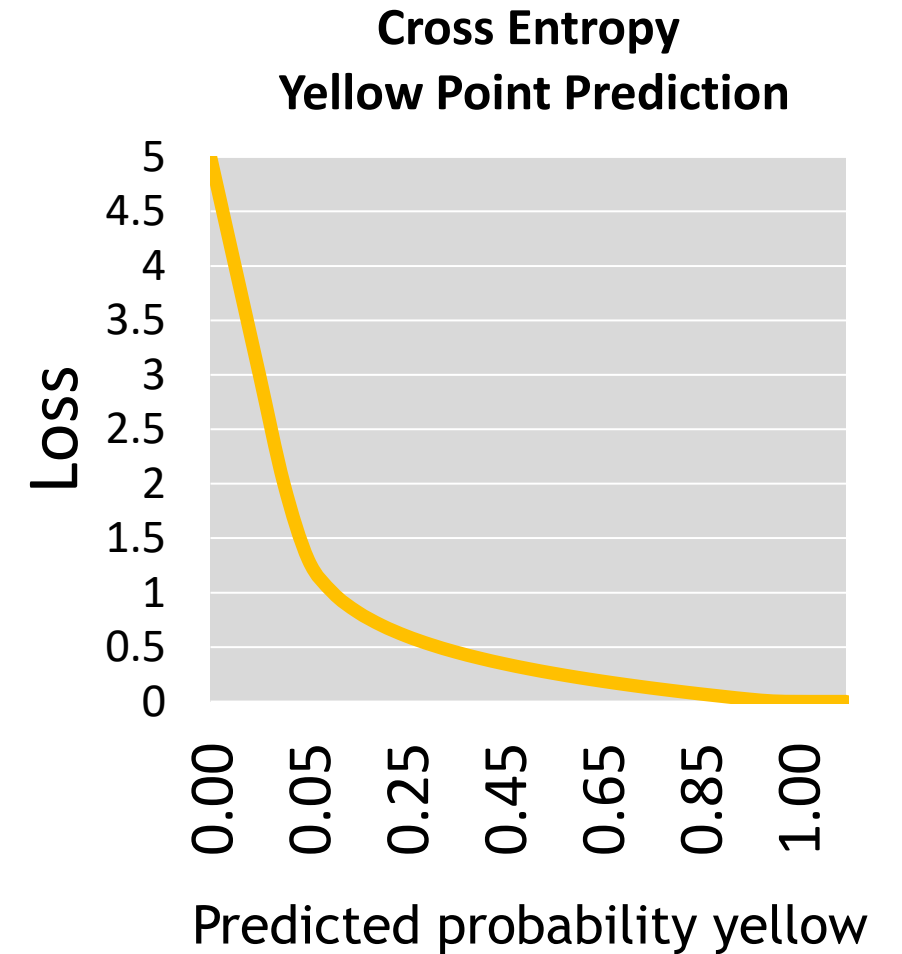
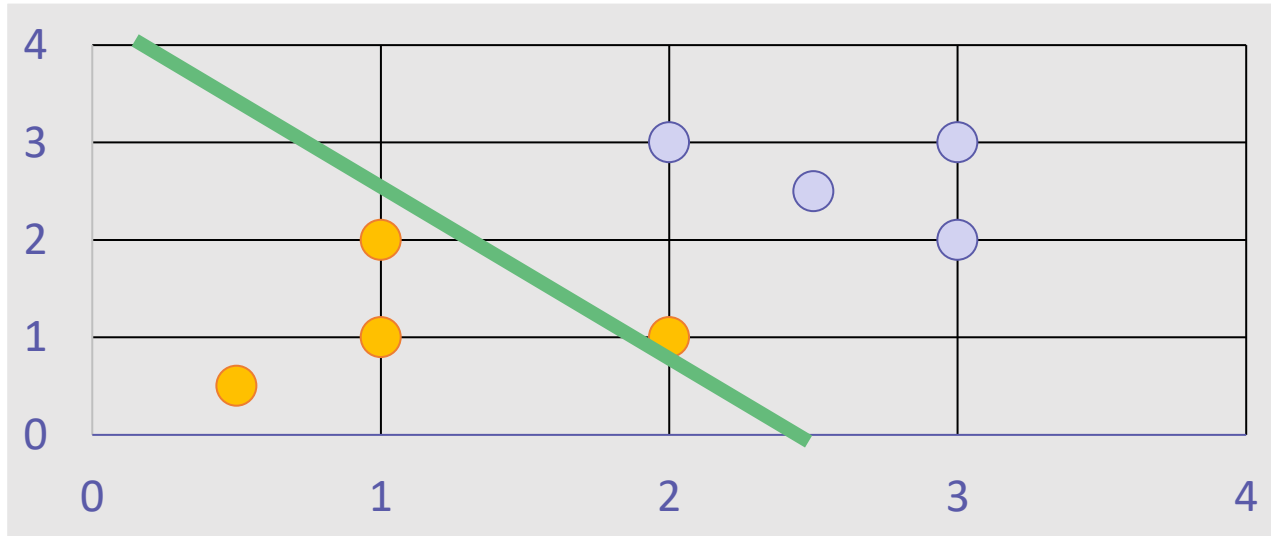


# Mean Squared Error (MSE)



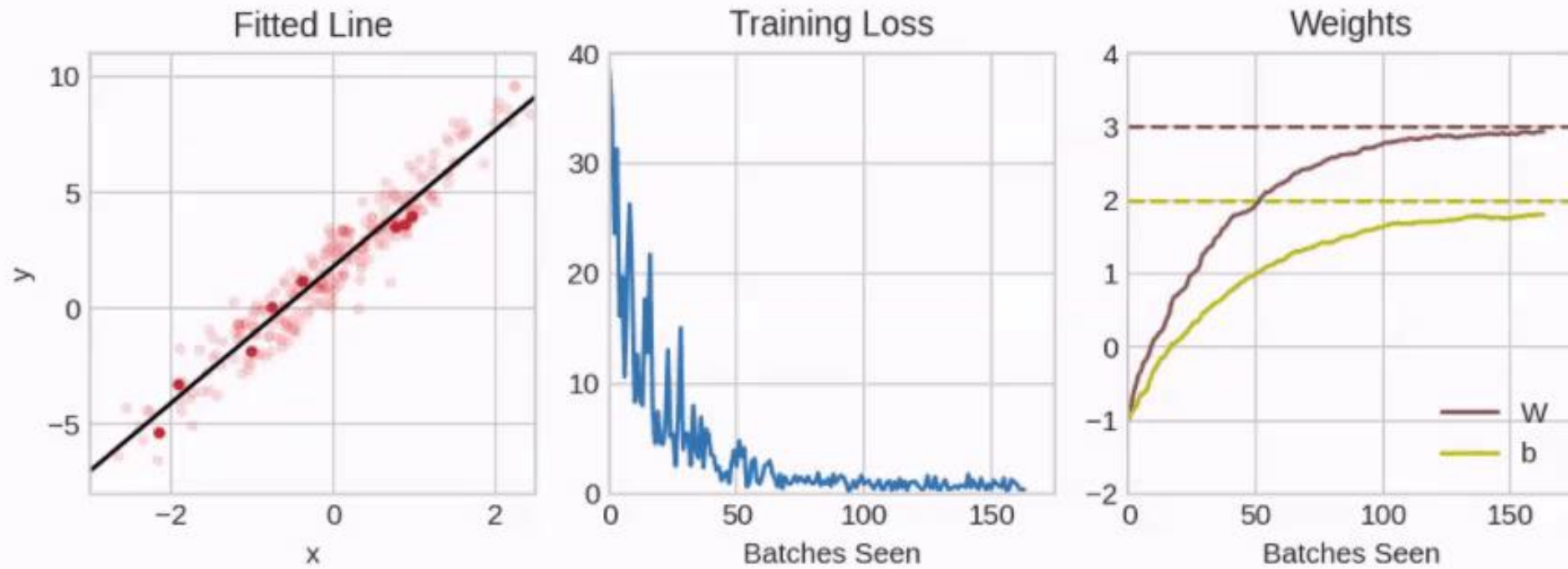


# Cross Entropy



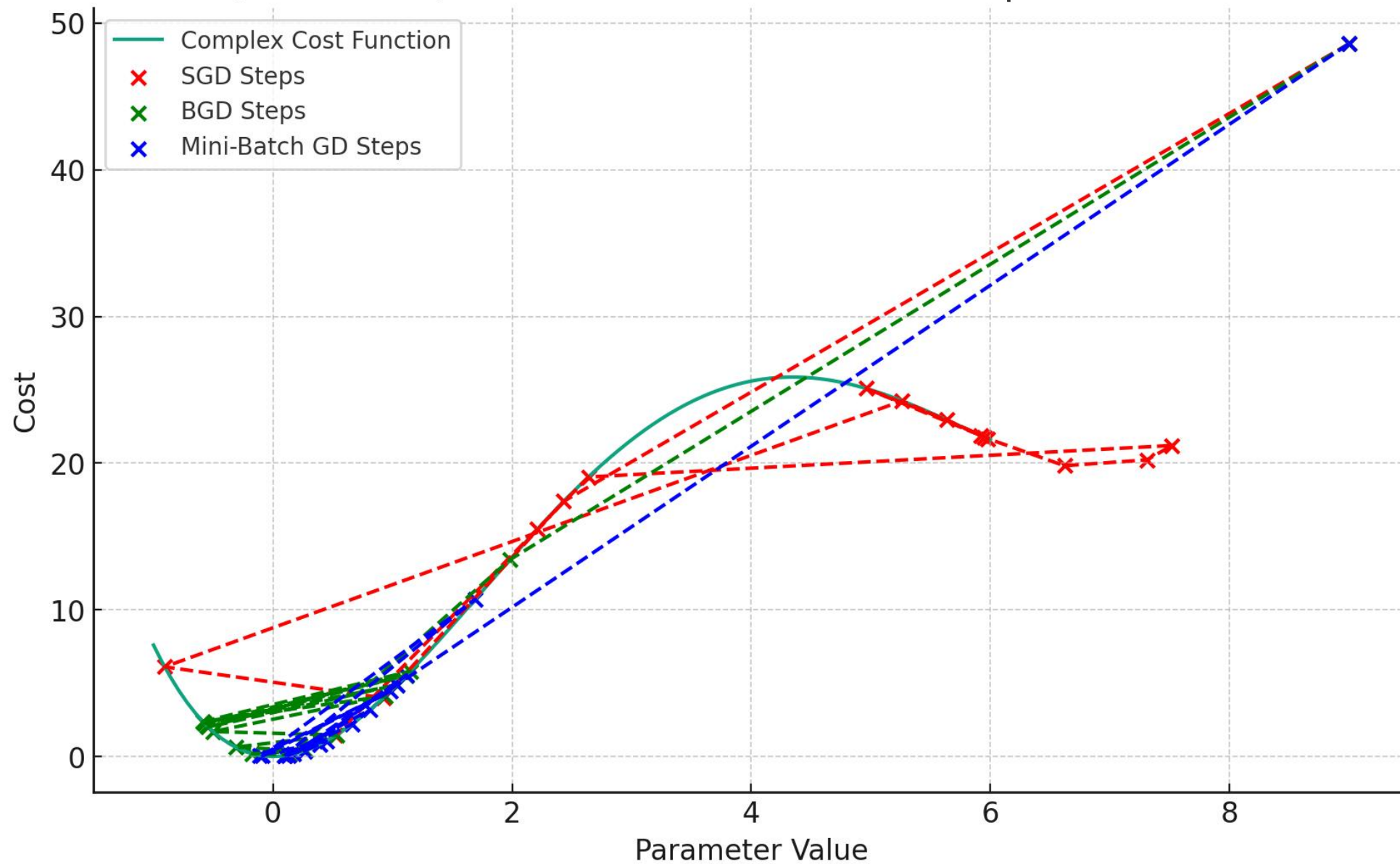


# **Optimizers & Advanced Gradient Descent Techniques**

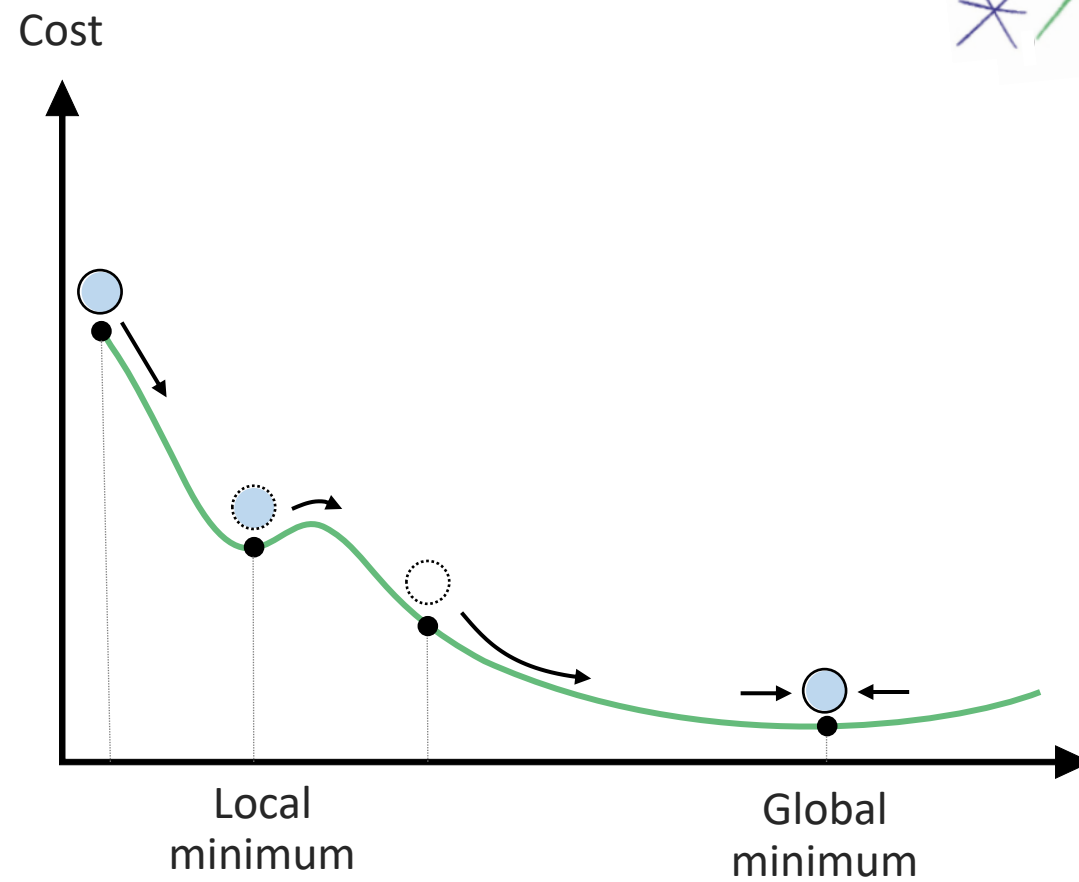
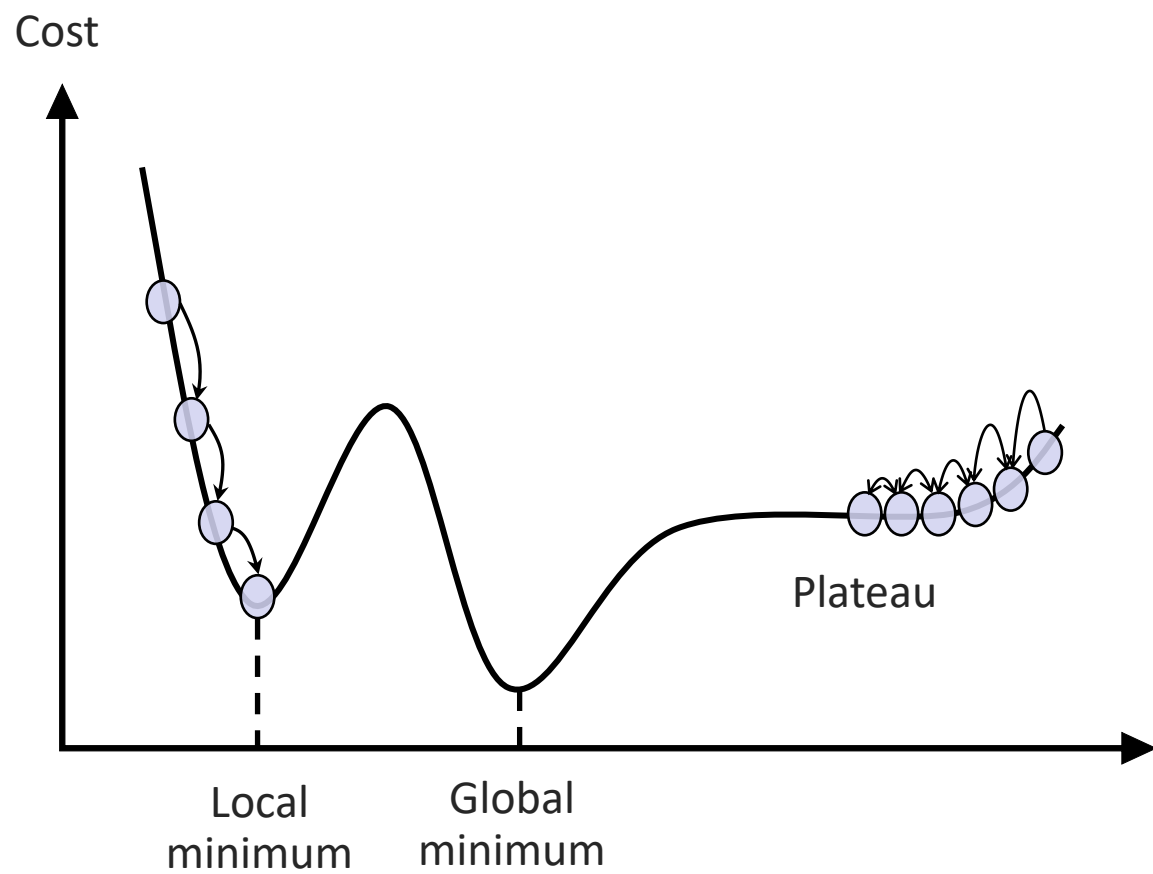


*Training a neural network with Stochastic Gradient Descent.*

# SGD, Batch GD, and Mini-Batch GD on a Complex Cost Function



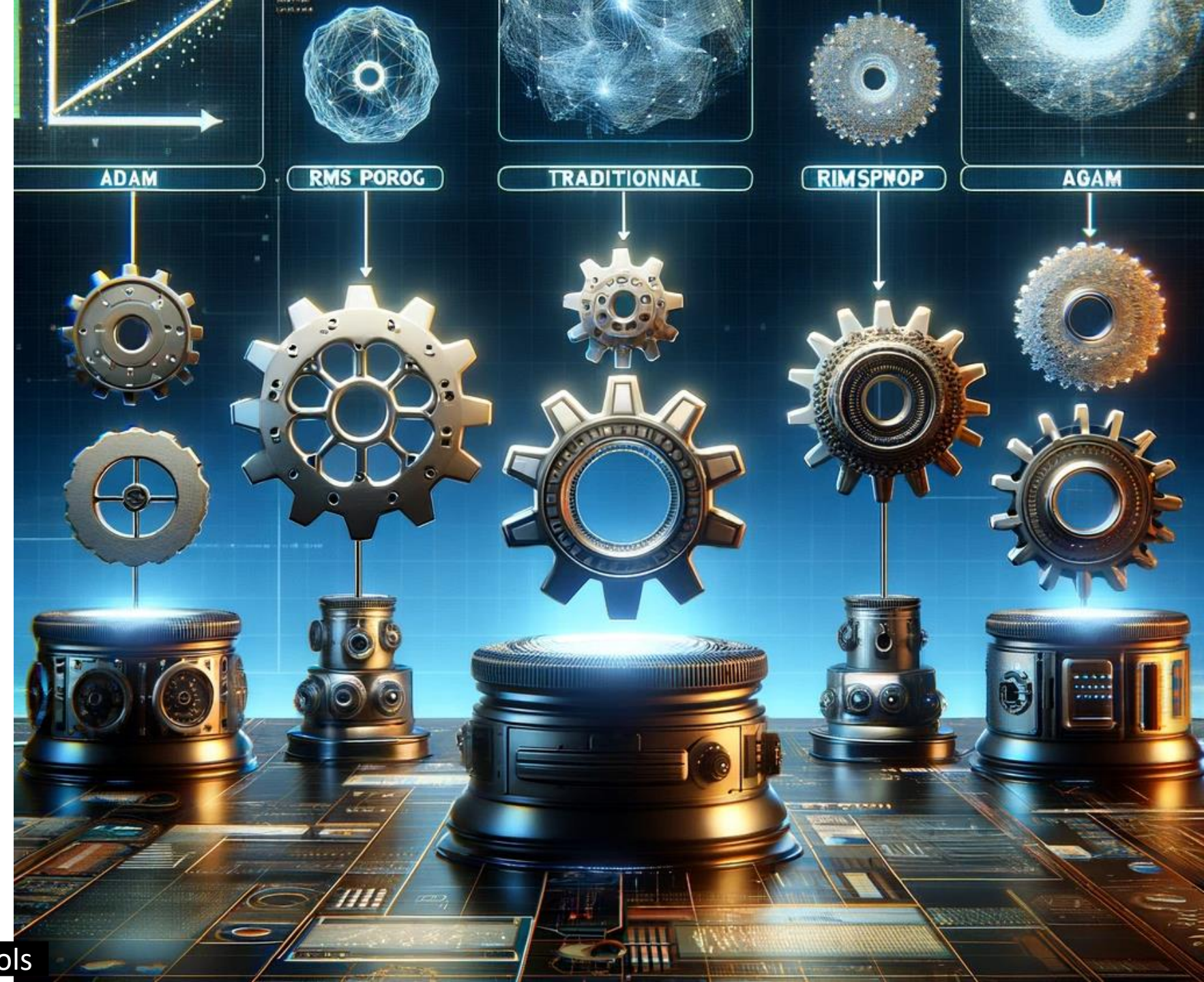
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# **Choosing the Right Optimizer: A Quick Guide**





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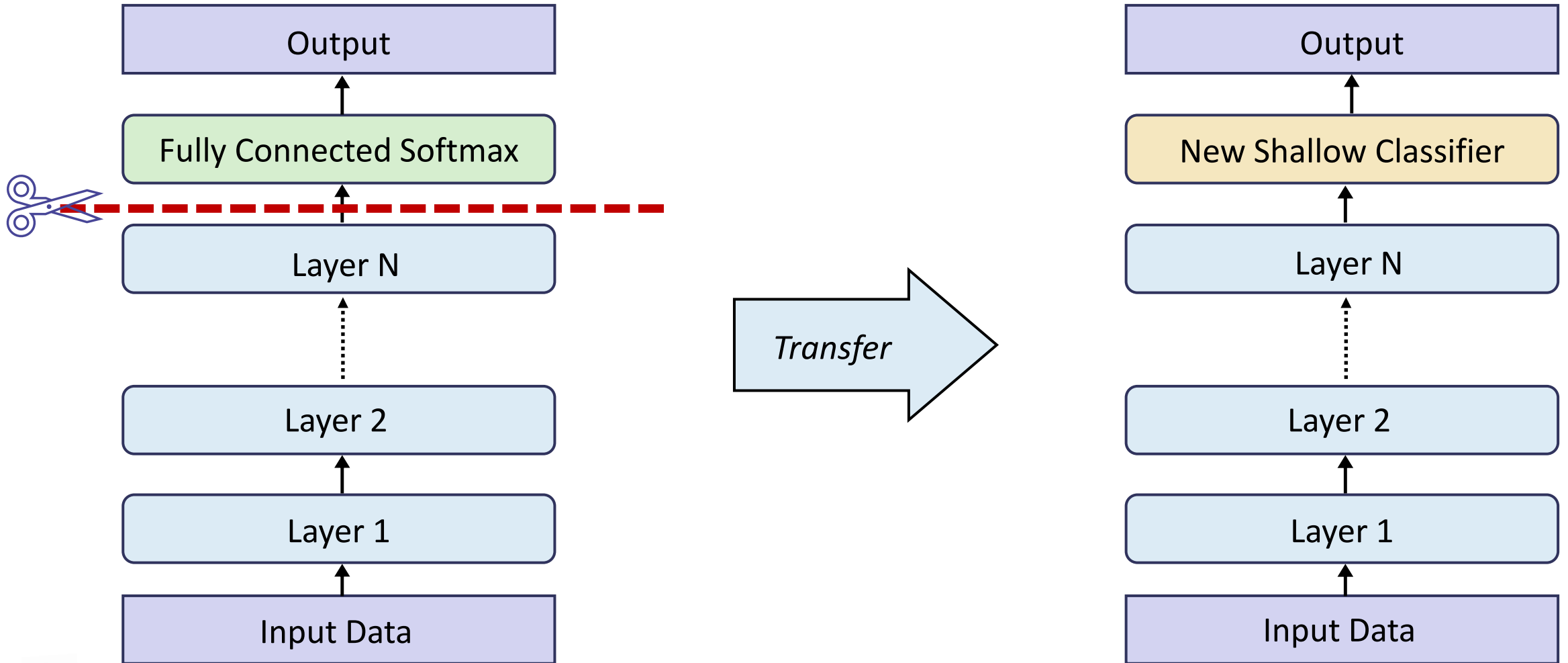
# Transfer Learning & Fine Tuning







# We Can Also Use What We've “Learned”





# 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!)