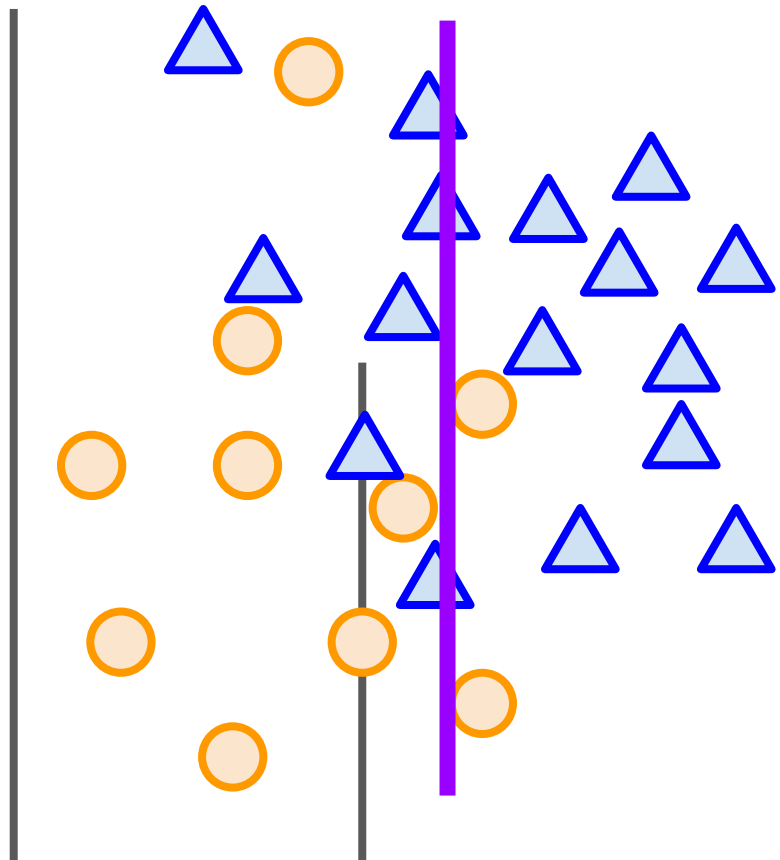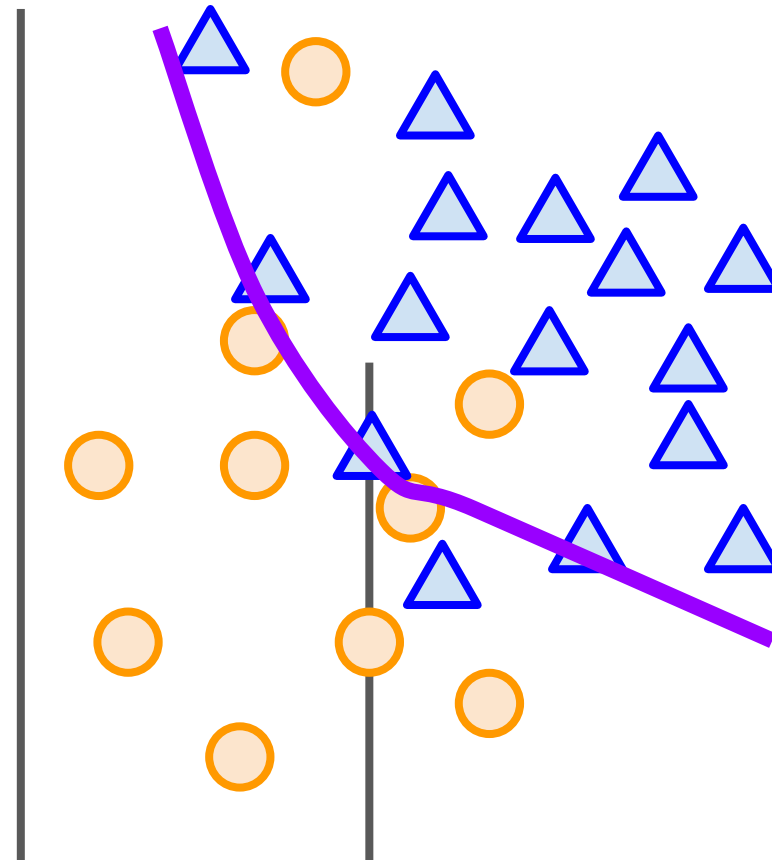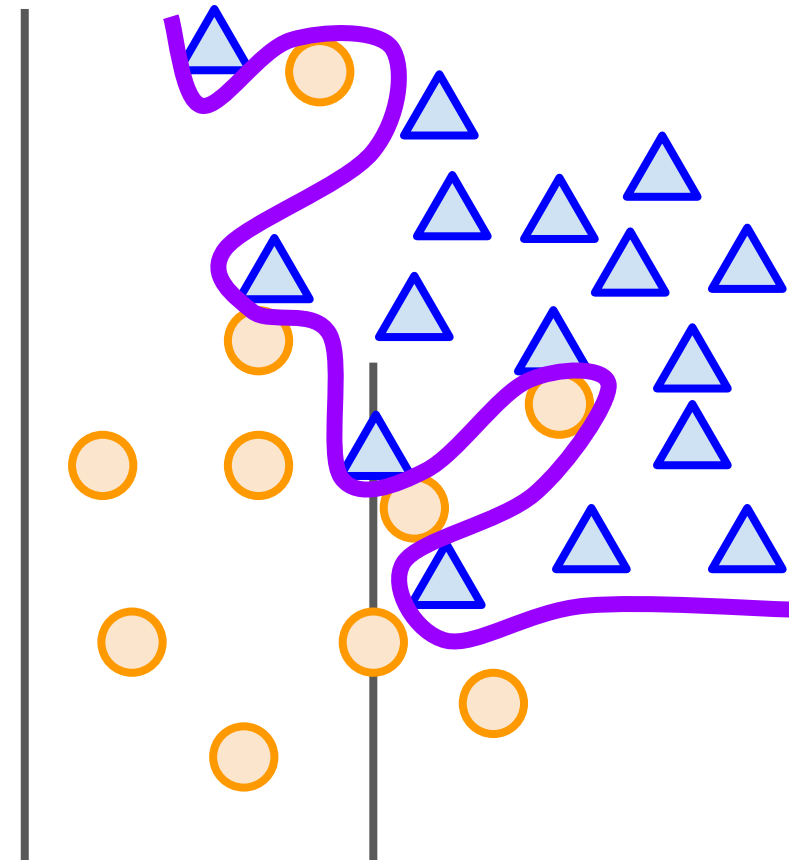# Underfitting vs. Overfitting

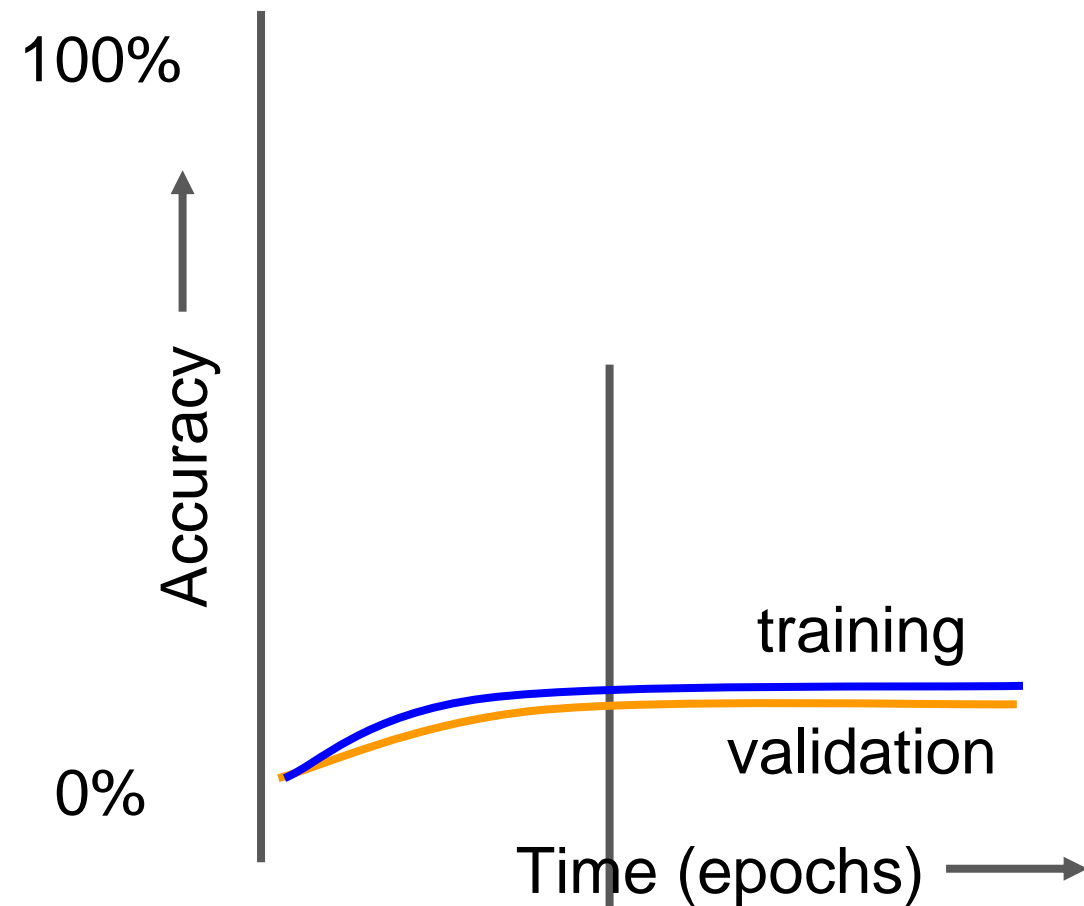**Underfit**: Model fails to capture trends in the data

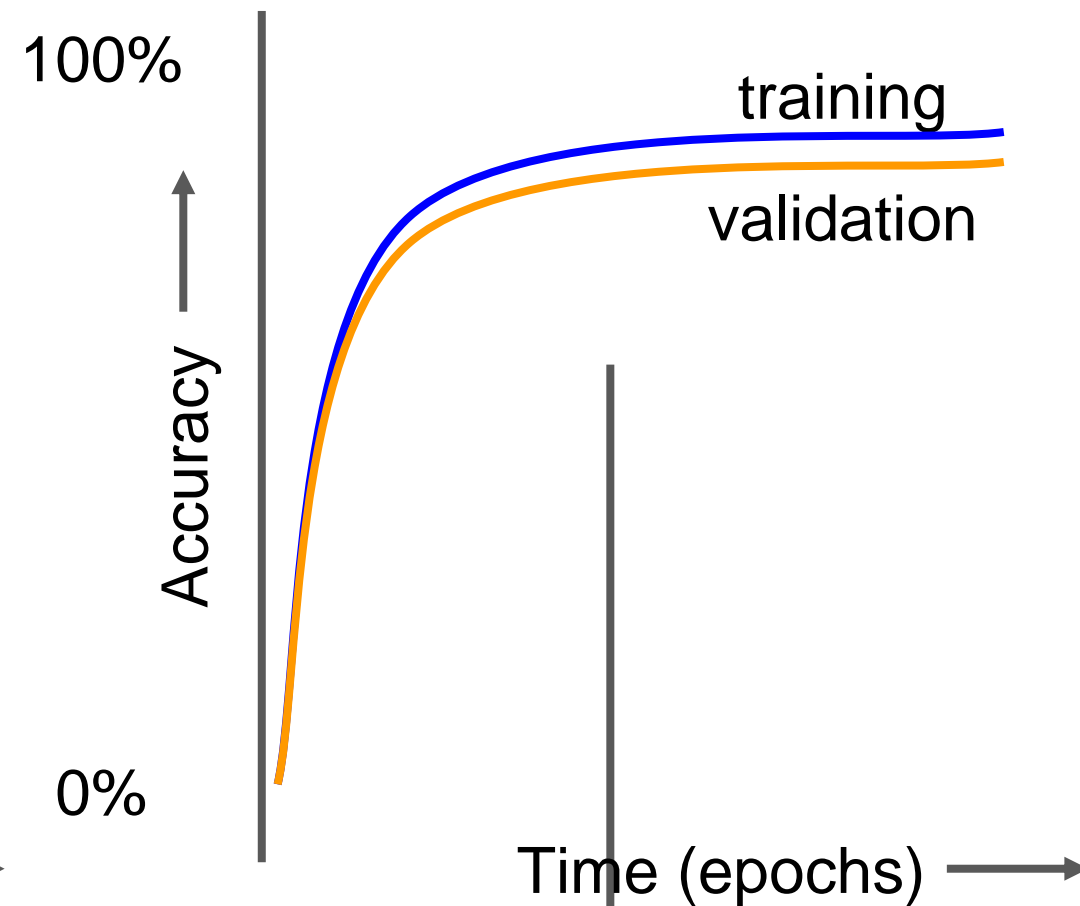**Good fit**: Model captures trends and can generalize to unseen data

Overfit: Model captures training data trends but fails on unseen data

Spotting Underfitting and Overfitting

Underfit: Model performs poorly on training and validation data

Good fit: Model generalizes well from training to validation data

Overfit: Model predicts training data well but fails to generalize to validation data
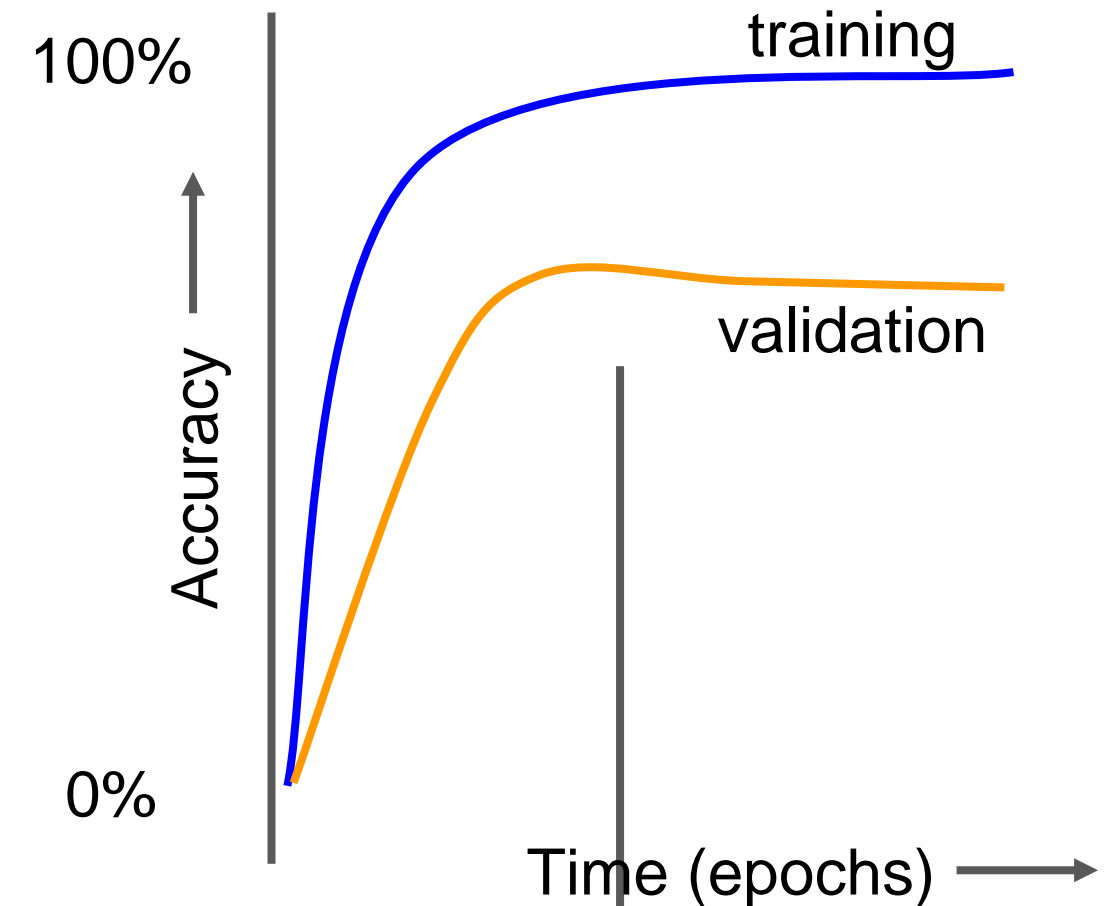
Spotting Underfitting and Overfitting

Underfit: Model performs poorly on training and validation data
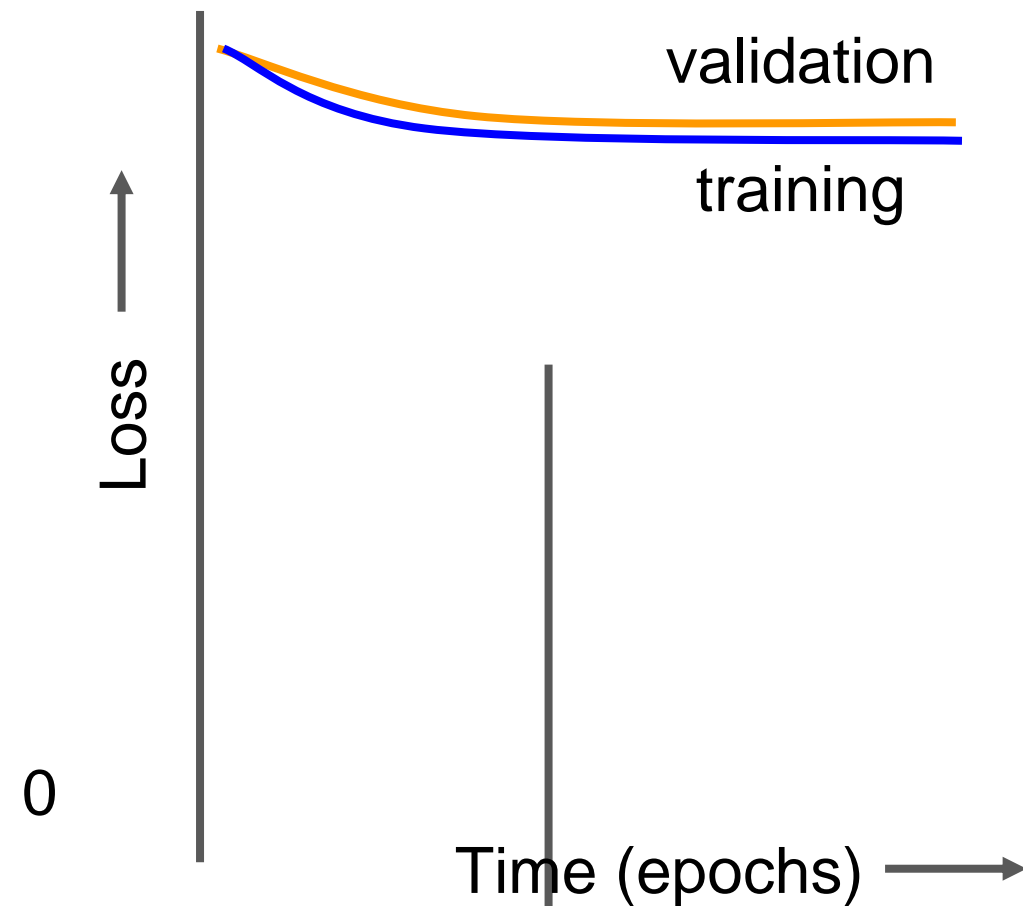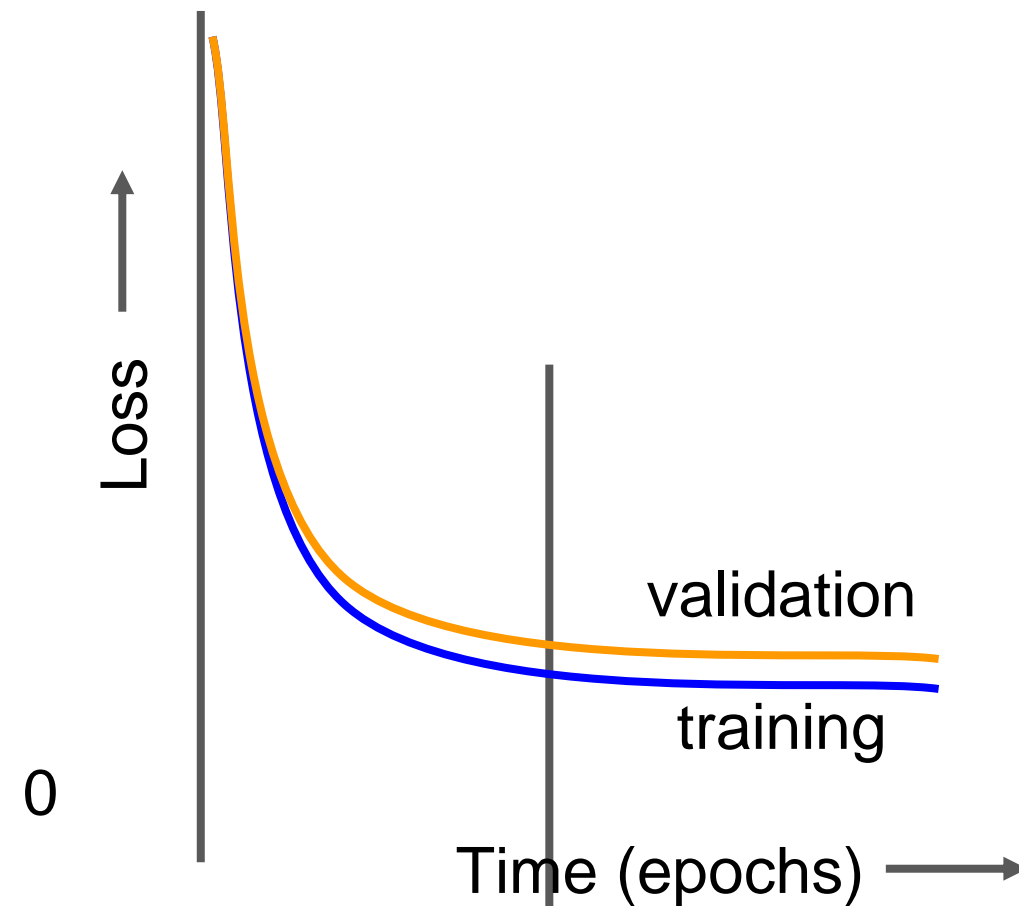
Good fit: Model generalizes well from training to validation data

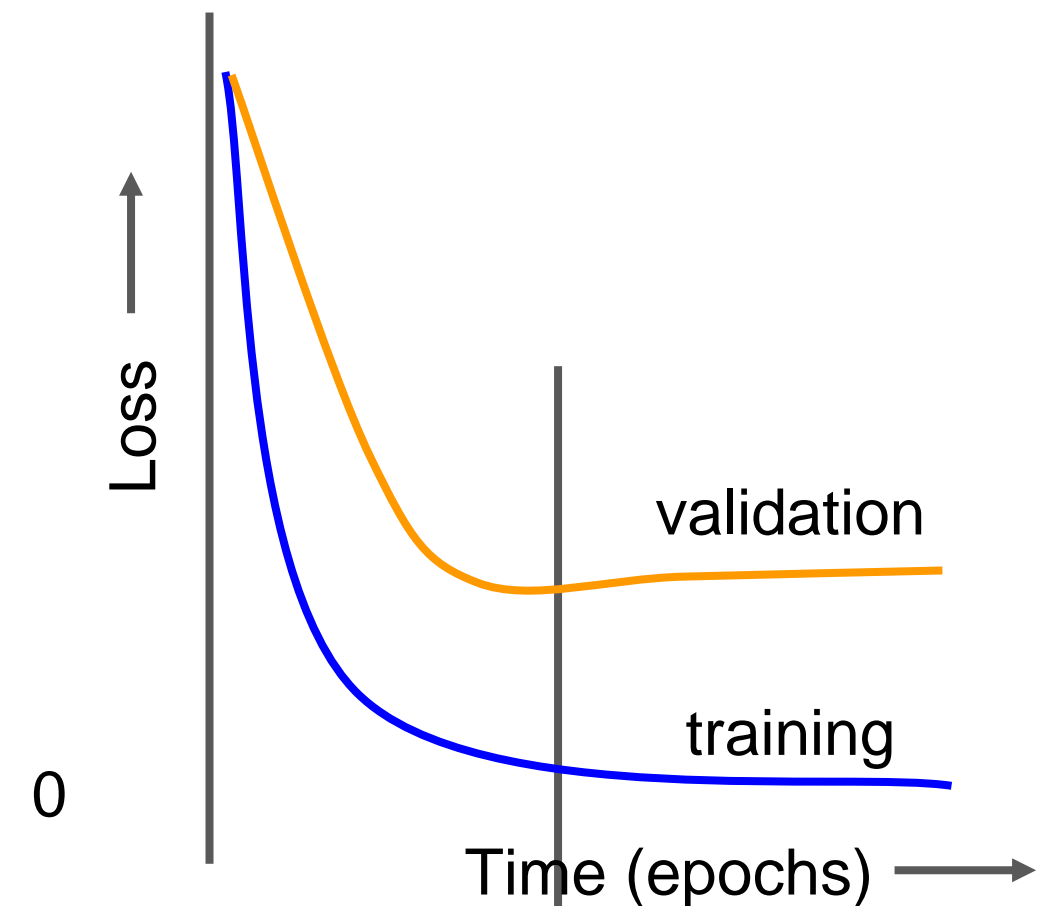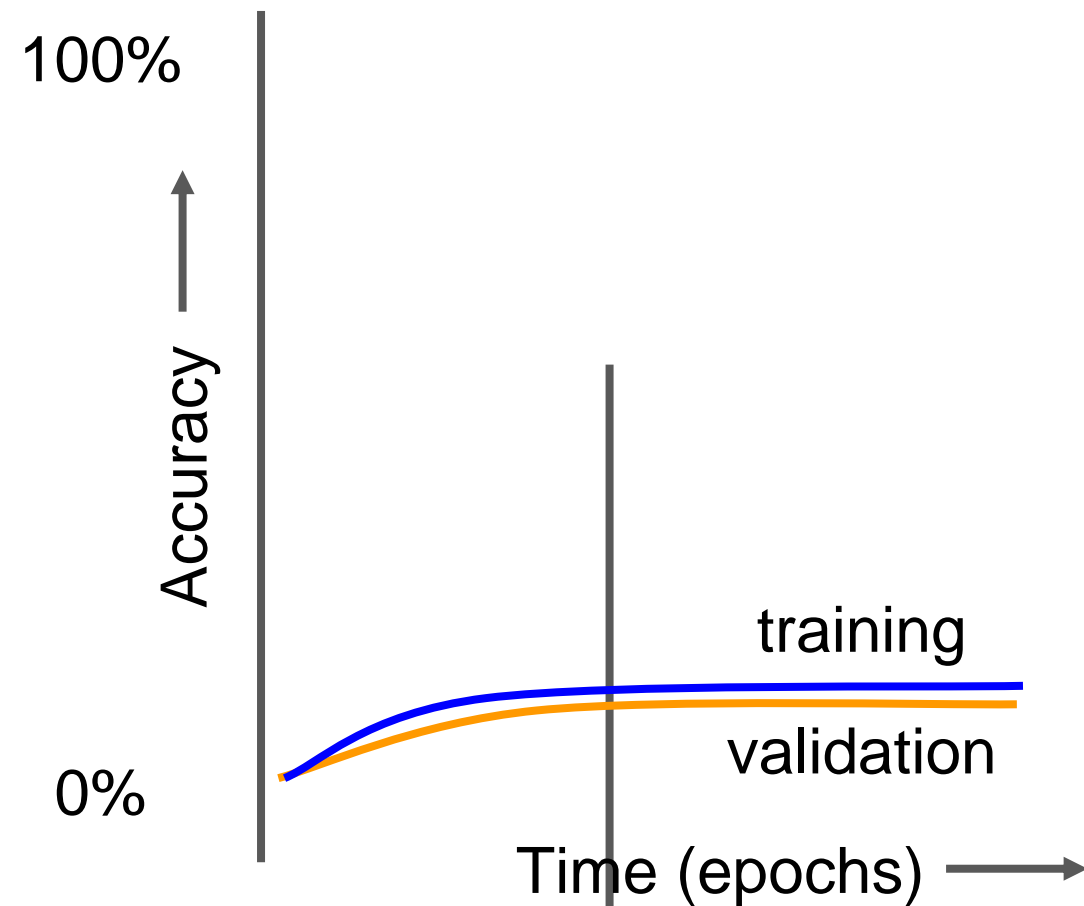**Overfit**: Model predicts training data well but fails to generalize to validation data

Fixing Underfitting

100%

Accuracy →

0%

training

validation

Time (epochs) →

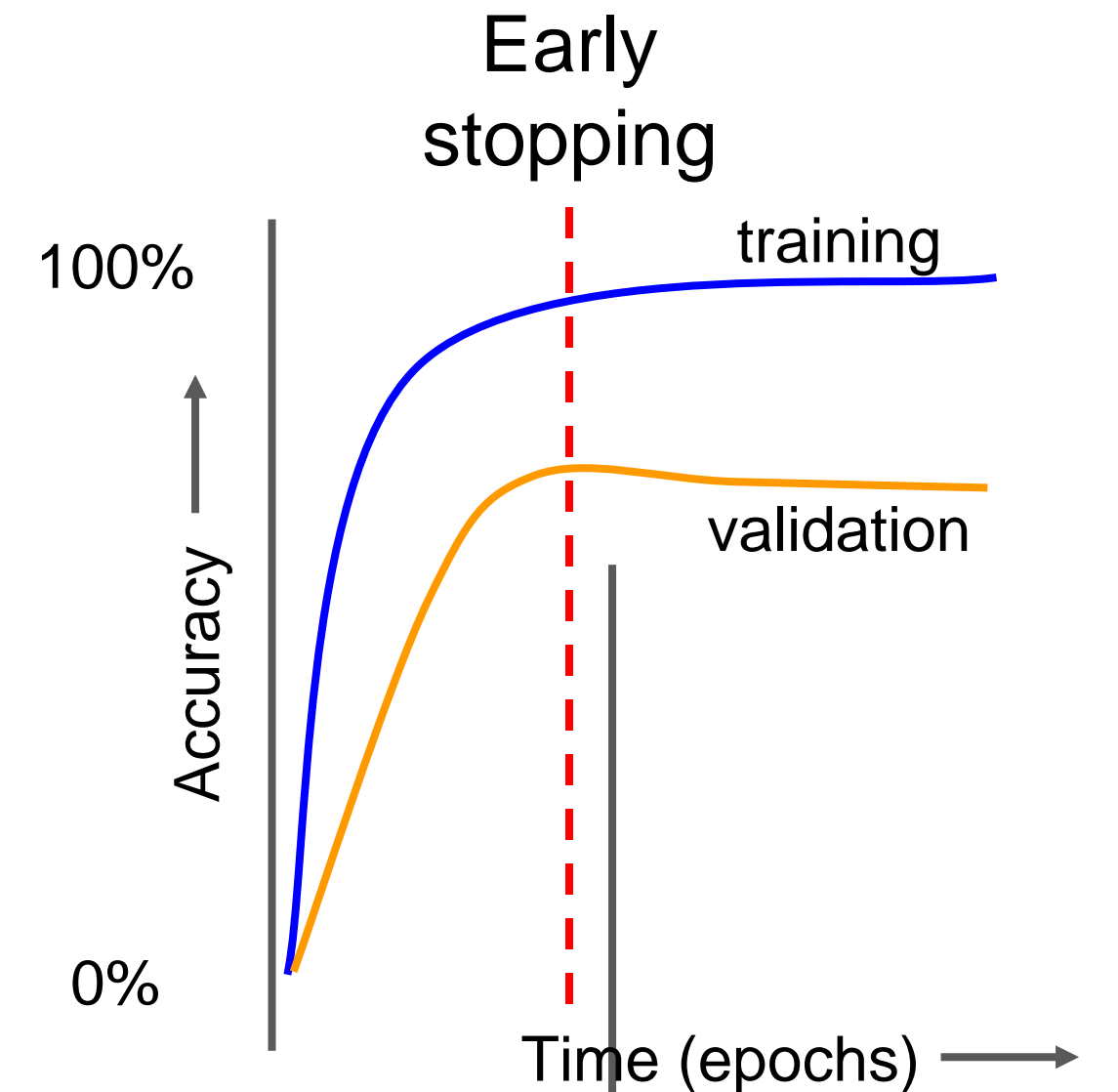**Underfit**: Model performs poorly on training and validation data

- Get more data
- Try different features or more features
- Train for longer
- Try a more complex model (more layers, more nodes, etc.)

Fixing Overfitting

- Get more data
- Early stopping
- Reduce model complexity
- Add regularization terms
- Add dropout layers (for neural networks)

Early stopping

100%

Accuracy

training

validation

0%

Time (epochs)

Overfit: Model predicts training data well but fails to generalize to validation data