Network Capacity and Complexity

Capacity Levels

Low Capacity

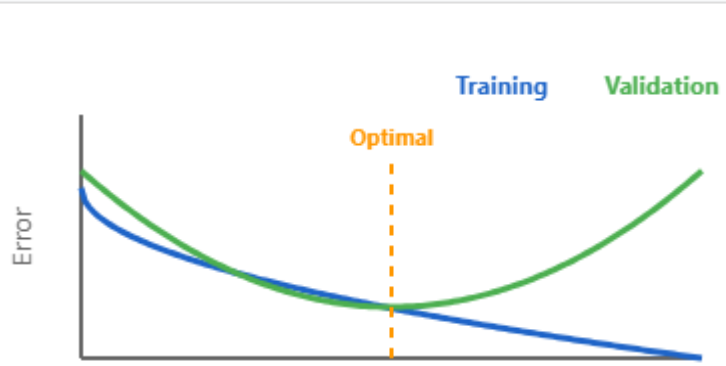
Few parameters
Simple patterns

Medium Capacity

Balanced
Good
generalization

High Capacity

Many parameters
Risk of overfitting



Key Factors

1. **Number of Layers**
   Depth increases model expressiveness

2. **Units per Layer**
   Width affects pattern complexity

3. **Total Parameters**
   More params = higher capacity

Parameters Count

$$P = \Sigma\ (n_l \times n_{l+1} + n_{l+1})$$

📉 Underfitting

Too simple model
High bias
→ Increase capacity

✓ Optimal

Right complexity
Good generalization
→ Balance achieved

📈 Overfitting

Too complex model
High variance
→ Reduce capacity / Regularize