Hyperparameter Tuning

🔍 Grid Search

Exhaustively searches through specified parameter combinations

✓ **Advantages:**

Comprehensive, guaranteed to find best in grid

🎲 Random Search

Randomly samples from parameter space for specified iterations

✓ **Advantages:**
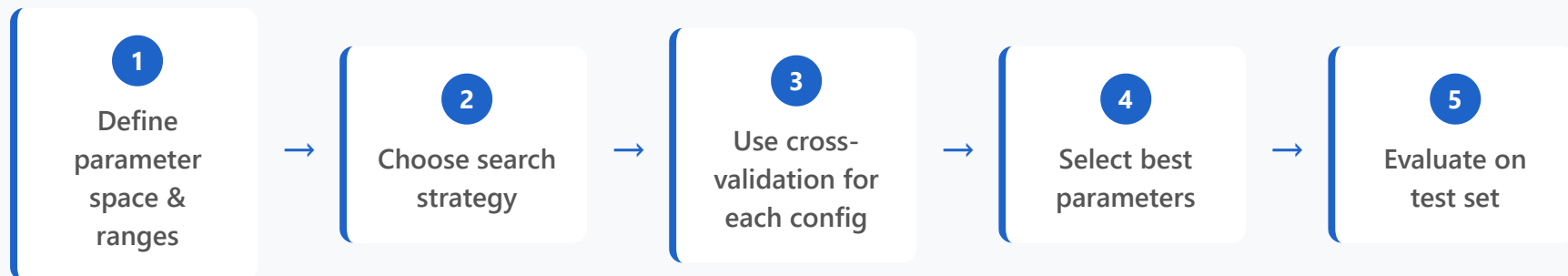
More efficient, explores wider range

🧠 Bayesian Optimization

Uses probabilistic model to guide search toward promising regions

✓ **Advantages:**

Smart search, fewer iterations needed

📋 Typical Tuning Workflow

1 Define parameter space & ranges → **2** Choose search strategy → **3** Use cross-validation for each config → **4** Select best parameters → **5** Evaluate on test set

🎯 **Best Practices**

⚠️	🔄	📊
Use validation set, never test set for tuning	Combine tuning with cross-validation	Start broad, then narrow search range
⏱️	📈	✓
Consider computational budget	Log-scale for learning rates	Automate with tools (sklearn, optuna)