Hyperparameter Search Strategies Comparison

Grid Search

Evaluations: 125

Coverage: Complete

Cost: $62,500

Time: 125 runs

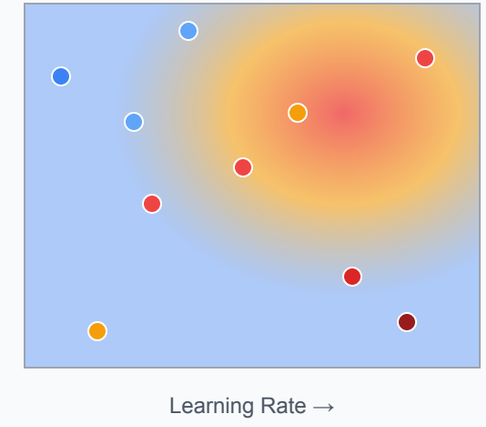
Pros:

- Guaranteed coverage
- Finds global optimum

Cons:

- Expensive
- Wastes evaluations

Random Search



Evaluations: 100

Coverage: Diverse

Cost: $50,000

Time: 100 runs

Pros:

- Better exploration
- Often finds better configs

Cons:

- No guarantees
- May miss optimum

Bayesian Optimization

Evaluations: 30

Coverage: Focused

Cost: $15,000

Time: 30 runs

Pros:

- Most efficient
- Learns from results

Cons:

- Complex setup
- Sequential (slower)

Population-Based Training

Evaluations: 20×10

Coverage: Adaptive

Cost: $100,000

Time: 10 steps (parallel)

Pros:

- Fast wall-clock time
- Explores + exploits

Cons:

- Needs many GPUs
- Complex coordination

Performance: Poor | Fair | Good | Better | Best | Optimal