

Chapter 6: Introducing Optimization

Optimization: the process of adjusting weights and biases to minimize loss.

After building a network and calculating loss, the next step is to *optimize* the parameters (weights and biases) to reduce that loss.

Random Search Approach:

- Randomly assign new weights and biases.
- Forward-pass data through the network.
- If the new loss is lower than before, save this configuration.
- This process is repeated for many iterations (e.g., 10,000 to 1 billion).
- **Problem:** While the loss might slightly decrease, accuracy barely improves. It is highly inefficient and not a practical method for training.

Better Approach:

- Instead of resetting weights randomly every time, **adjust them slightly** from their current values.
- If the new configuration reduces loss, keep it. Otherwise, revert.
- This strategy still uses randomness but allows for *gradual improvement* from the best-known state, avoiding total resets.

These are rudimentary and highlight the need for smarter optimization techniques like gradient descent.