Neural Networks: Limitations & Criticisms

Black Box Problem

- Hard to interpret decisions

- Cannot explain "why"

- Problematic for regulated industries

Data Hungry

- Need lots of labeled data

- Small data = overfitting

- Labeling is expensive

VS

Computational Cost

- Training is expensive

- Large models need GPUs

- Environmental concerns

Brittleness

- Adversarial examples

- Distribution shift

- Unreliable uncertainty

Despite Limitations:

Neural networks achieve state-of-the-art on
many practical tasks (vision, NLP, games, ...)