Proposed Project Topics:

1. Minimum Network Capacity for MNIST

RQ: What is the minimum network size that achieves competitive classification accuracy?

Pros

- Examines limits of model capacity
- Demonstrates accuracy–complexity trade-off
- Quantifies diminishing performance returns

Pros

- Restricted to simple image classification
- Limited generalizability beyond MNIST
- Benchmark is already highly optimized

2. Depth vs Width Trade-Off

RQ: For equal parameter budgets, does increasing depth or width yield better performance?

Pros

- Investigates architectural efficiency
- Explores structural design principles
- Connects empirical results to theory

Cons

- Differences may be subtle on simple tasks
- Strongly dependent on architectural constraints

3. Model Capacity vs Training Data Size

RQ: How does optimal model capacity vary with available training data?

Pros

- Differences may be subtle on simple tasks
- Strongly dependent on architectural constraints

Cons

- Results may be dataset-specific
- Requires multiple controlled experiments