🔬 Phase 1: Learning Rate Optimization

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LEARNING RATE EXPERIMENTS

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Testing Learning Rate: 1e-05

Best Accuracy: 0.9404

Final Accuracy: 0.9404

F1-Score: 0.9403

Testing Learning Rate: 5e-05

Best Accuracy: 0.9677

Final Accuracy: 0.9578

F1-Score: 0.9580

Testing Learning Rate: 0.0001

Best Accuracy: 0.9603

Final Accuracy: 0.9578

F1-Score: 0.9578

Testing Learning Rate: 0.0005

Best Accuracy: 0.9653

Final Accuracy: 0.9504

F1-Score: 0.9504

Testing Learning Rate: 0.001

Best Accuracy: 0.9628

Final Accuracy: 0.9628

F1-Score: 0.9629

Testing Learning Rate: 0.005

Best Accuracy: 0.9653

Final Accuracy: 0.9628

F1-Score: 0.9629

Testing Learning Rate: 0.01

Best Accuracy: 0.9702

Final Accuracy: 0.9628

F1-Score: 0.9629

🏆 OPTIMAL LEARNING RATE: 0.01

Best Accuracy: 0.9702

🔬 Phase 2: Batch Size Optimization

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BATCH SIZE EXPERIMENTS

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Testing Batch Size: 8

Best Accuracy: 0.9677

Final Accuracy: 0.9603

F1-Score: 0.9604

Testing Batch Size: 16

Best Accuracy: 0.9702

Final Accuracy: 0.9504

F1-Score: 0.9505

Testing Batch Size: 32

Best Accuracy: 0.9653

Final Accuracy: 0.9578

F1-Score: 0.9580

Testing Batch Size: 64

Best Accuracy: 0.9578

Final Accuracy: 0.9529

F1-Score: 0.9529

Testing Batch Size: 128

Best Accuracy: 0.9653

Final Accuracy: 0.9653

F1-Score: 0.9654

Testing Batch Size: 256

Best Accuracy: 0.9578

Final Accuracy: 0.9479

F1-Score: 0.9478

🏆 OPTIMAL BATCH SIZE: 16

Best Accuracy: 0.9702

🔬 Phase 3: Preprocessing Method Comparison

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DATA PREPROCESSING EXPERIMENTS

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Testing Preprocessing: none

Best Accuracy: 0.9603

Final Accuracy: 0.9553

F1-Score: 0.9553

Testing Preprocessing: zscore

Best Accuracy: 0.9653

Final Accuracy: 0.9553

F1-Score: 0.9553

Testing Preprocessing: minmax

Best Accuracy: 0.9702

Final Accuracy: 0.9628

F1-Score: 0.9630

Testing Preprocessing: robust

Best Accuracy: 0.9479

Final Accuracy: 0.9454

F1-Score: 0.9453

Testing Preprocessing: log

Best Accuracy: 0.9702

Final Accuracy: 0.9578

F1-Score: 0.9578

Testing Preprocessing: clipped

Link:

<https://drive.google.com/drive/folders/1gX-jrmWtr0g27BMpphLnQ9tL3CV3_kJM?usp=sharing>

