ReparoML — User Manual

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Requirements

- Python 3.10+ - PyTorch 2.2+ - torchvision, numpy, pandas, matplotlib, pyyaml, tqdm

Installation

1) Create a virtual environment 2) pip install -r requirements.txt

Quickstart

Train baseline: python experiments/run_mnist_cnn.py --phase train --out outputs/mnist_baseline Fault inject: python experiments/run_mnist_cnn.py --phase fault --in_ckpt outputs/mnist_baseline/best.pt --out outputs/mnist_faults Repair: python experiments/run_mnist_cnn.py --phase repair --in_ckpt outputs/mnist_faults/faulted.pt --out outputs/mnist_repair --tgrm_steps 200 Retrain: python experiments/run_mnist_cnn.py --phase retrain --in_ckpt outputs/mnist_faults/faulted.pt --out outputs/mnist_retrain --epochs 2

Outputs

Each run emits metrics.csv, checkpoints (*.pt), and figures. Use plot_runs.py for summary plots.

Troubleshooting

- If CUDA is unavailable, set --device cpu - If downloads fail, pre-download MNIST - Ensure write permissions to outputs/ directory