

GPU Vector Addition Performance Report

Experiment: CPU vs GPU vector addition using NumPy and CuPy

Observation: GPU acceleration does not outperform CPU for moderate vector sizes.

Reason: kernel launch overhead and host-device memory transfer dominate computation.

Conclusion: GPUs provide benefits when workload size is large enough to amortize overhead.

GPU Environment:

GPU Device: NVIDIA GeForce RTX 3070 Laptop GPU

GPU Memory: 8191 MB

CUDA Version: 12.9

CuPy Version: 13.6.0

Unit Test Verification:

All unit tests passed successfully ■

