A) Runtime Scaling with Image Size

Conventional DI scaling: 0.92
PCA DI scaling: 0.05

Runtime (ms/pattern) vs Number of Pixels

- Conventional DI
- PCA DI (512 components)
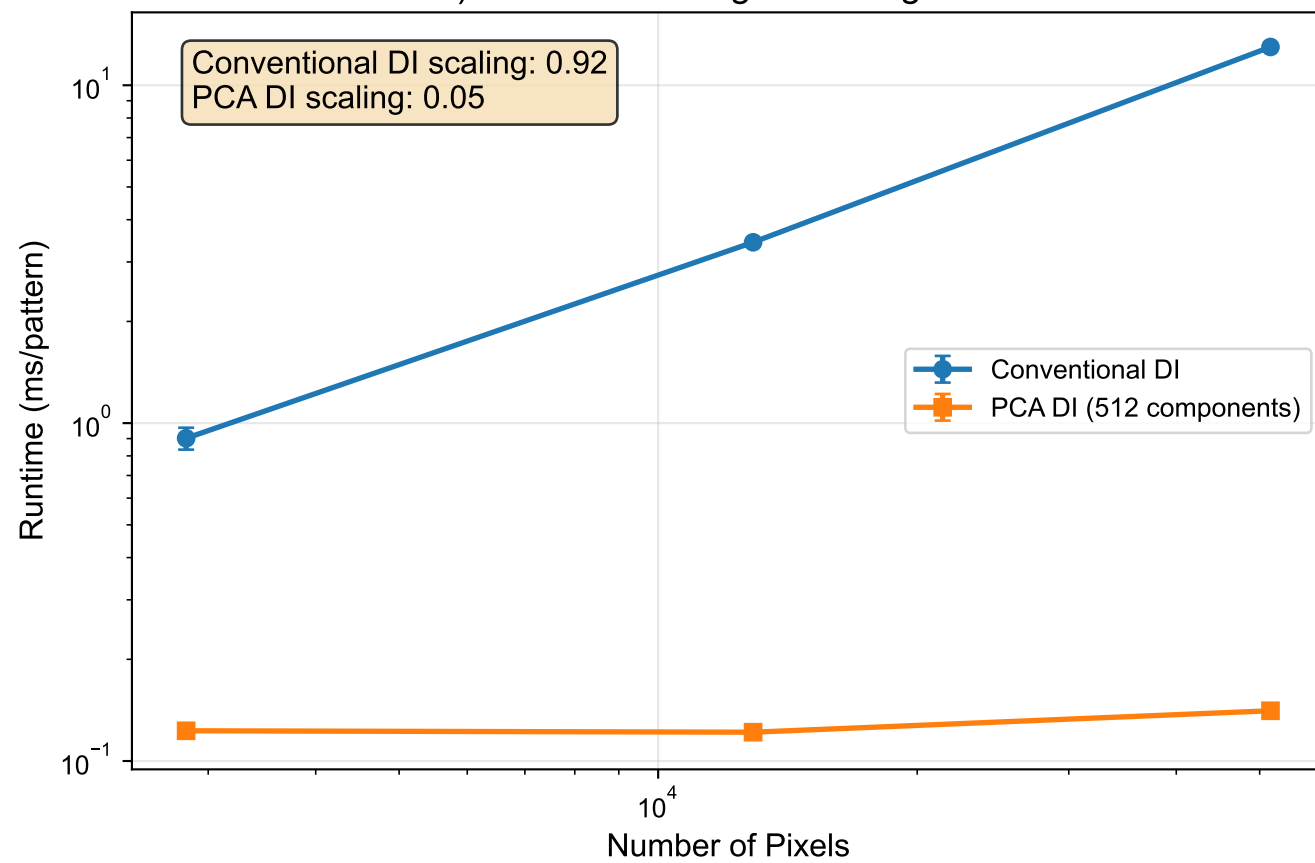
B) PCA-DI Speedup vs Image Size

Speedup Factor (×) vs Number of Pixels

7.3×, 28.2×, 92.2×
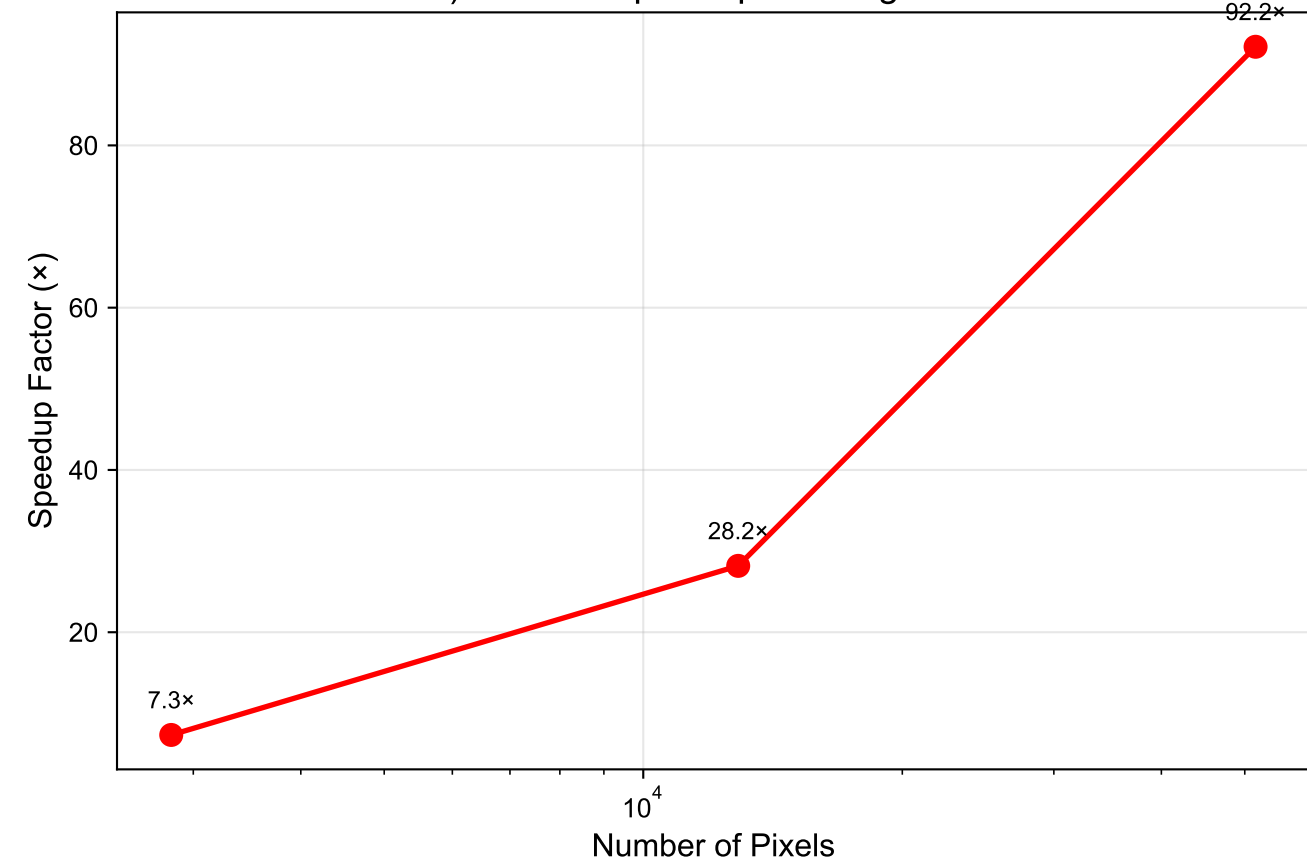
C) Speedup vs Dimensionality Reduction

Speedup Factor (×) vs Dimensionality Reduction Factor

- - - Theoretical (30% efficiency)
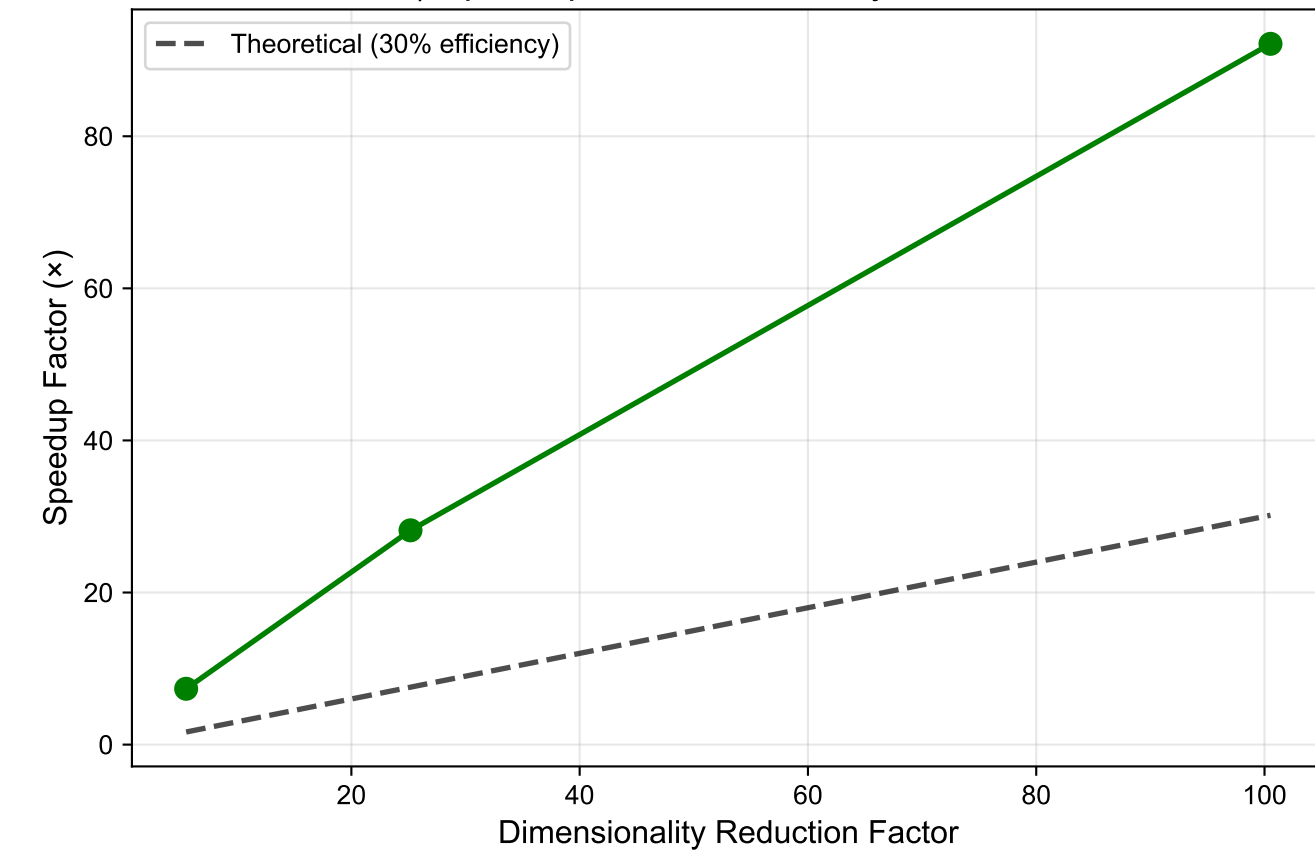
D) Scaling Summary

Image Size	Pixels	Speedup	Improvement
60×60	2,828	7.3×	1.0×
128×128	12,892	28.2×	3.8×
256×256	51,468	92.2×	12.6×

Key Finding:
Speedup scales from 7.3× to 92.2×
(13× improvement with larger images)