CAPE: Criticality-Aware Performance and Energy Optimization Policy for NCFET-based Caches

DIVYA PRANEETHA RAVIPATI, IIT Delhi
RAMANUJ GOEL, IIT Delhi
VICTOR M. VAN SANTEN, University of Stuttgart
HUSSAM AMROUCH, Technical University of Munich
PREETI RANJAN PANDA, IIT Delhi

1 APPENDIX A

1.1 FinFET-based LLC results evaluation

We evaluated the *CAPE* policy for FinFET-based LLC along with the baselines. V_top is set to V_{max} to apply *CAPE* for FinFET-based caches. Figure 1 shows the cache energy savings, slowdown, EDP savings, and throughput degradation with the baseline policies and CAPE compared to operating the LLC at 0.7 V. From our experimental evaluations, we observe that operating the FinFET-based cache at 0.3 V (V_{min}) resulted in higher energy and EDP savings while degrading throughput. However, CAPE chooses to operate at a voltage (may not be V_{min}) to reduce energy with minimal impact performance. We observe that CAPE results in the energy and EDP savings of 60 % similar to the best performing baseline policies for FinFET-based LLC along with a similar slowdown and throughput degradation of 3.8 %.

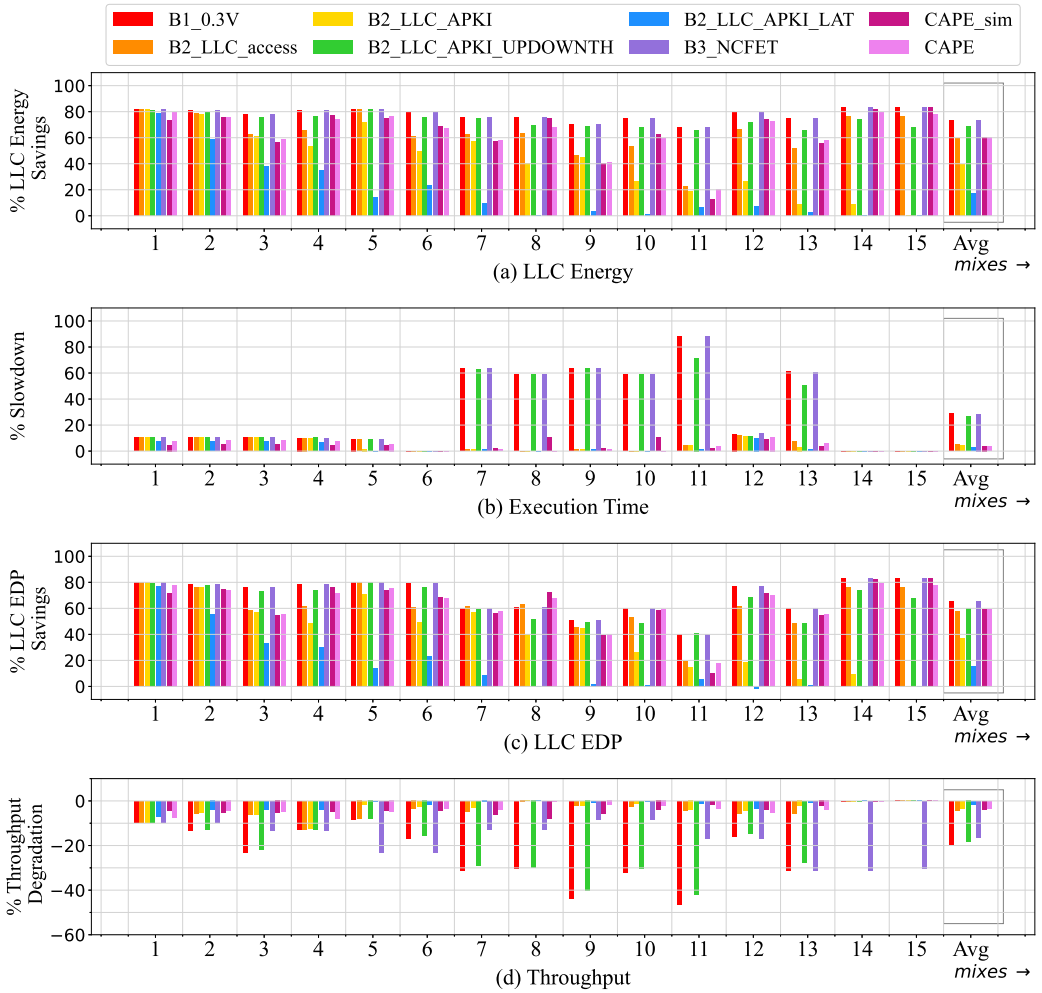

Fig. 1. Normalized FinFET-based LLC Energy savings, Slowdown, EDP savings, and Throughput degradation with the baseline policies and CAPE in percentages compared to operating the LLC at 0.7 V