LVCP vs RVA-Toru: Performance Delta Analysis

Table 1: Delta Statistics ($\Delta = \text{MPKI}_{\text{LVCP}} - \text{MPKI}_{\text{RVA-Toru}}$)

Statistic	Value (MPKI)
Average	+0.1664
Std Dev	0.4111
Median	+0.0722

Improvement Analysis:
RVA-Toru beats LVCP on 92 out of 105 traces (87.6%).
Worst-Case MPKI:
LVCP: 23.5688
RVA-Toru: 21.6842

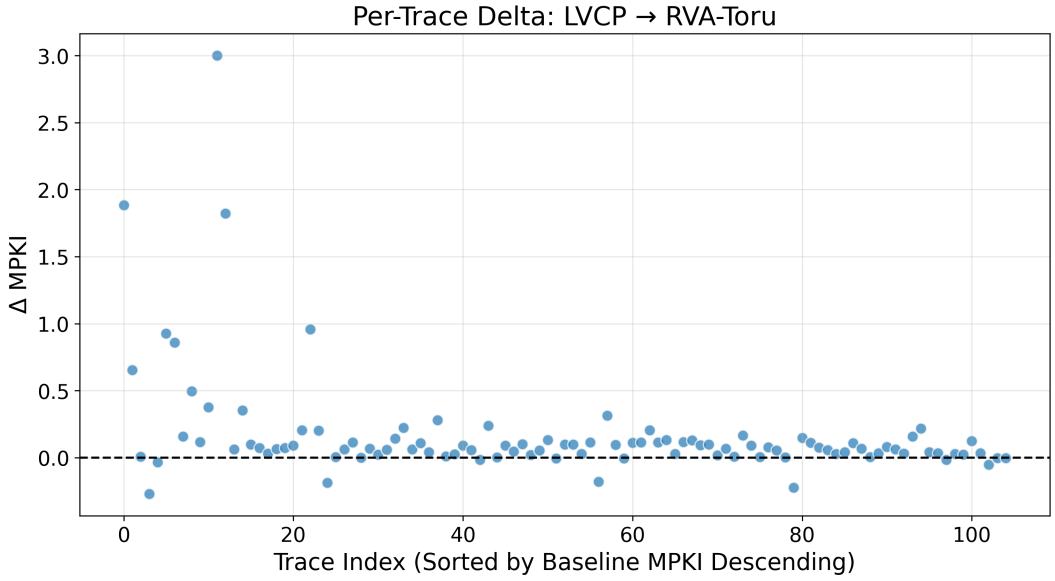

Figure 1: Per-trace Δ MPKI: LVCP → RVA-Toru

Conclusion:
RVA-Toru mostly subsumes LVCP, providing superior prediction on 87.6% of workloads. This is expected, as RVA-Toru leverages register values, hashing multiple values and handling register renaming and reuse, leading to better prediction. LVCP may perform better when there are sufficient memory loads before branches, but it only tracks memory-driven values, whereas RVA-Toru uses all register values with efficient 12-bit digest encodings.