Pushing the branch predictability limits with the multi-poTAGE+SC predictor

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Competition track:

Unlimited size
We did **not** modify the predictor algorithm after the submission.

We just corrected a bug (out of bound array write) that had almost no impact on prediction accuracy.
What we did
What we did

André

TAGE

statistical corrector (SC)
What we did

André

TAGE

statistical corrector (SC)

Pierre

multi-poTAGE (MP)
What we did

André

TAGE

statistical corrector (SC)

Pierre

multi-poTAGE (MP)

Approximately same prediction accuracy on average, but significant differences on individual traces
What we did

TAGE

statistical corrector (SC)

multi-poTAGE (MP)
What we did

TAGE

multi-poTAGE (MP)

statistical corrector (SC)
What we did

statistical corrector (SC)

multi-poTAGE (MP)
What we did

statistical corrector (SC) → multi-poTAGE (MP)
What we did

change a few parameters because of the memory size constraint
Multi-poTAGE + Statistical Corrector

MP

SC
Multi-poTAGE + Statistical Corrector

-5% MPKI
Conclusion

- Performance gain of MP+SC over TAGE-SC comes mainly from the non-global components of multi-poTAGE

- With the Statistical Corrector, the post-predictor in poTAGE is almost superfluous
  - on isolated poTAGE, removing the post-predictor $\Rightarrow$ +10% MPKI
  - with SC, removing post-predictor $\Rightarrow$ +1% MPKI

- The Statistical Corrector solves the cold-counter problem more effectively than the post-predictor
Questions ?