The Journal of Instruction Level Parallelism

Championship Branch Prediction

website: http://www.jilp.org/cbp

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Introduction: Competition Overview and Workshop Agenda

Jared Stark, *MRL/MTL Intel*

Overview

- Objective: Compare branch predictors in a common framework.
- Framework
  - Traces
    - 30M inst long, includes user + system activity
    - 2 trace sets: distributed + undistributed
    - 20 traces / set: 5 INT, 5 FP, 5 MEDIA, 5 SERVER
  - Driver
    - Static Info: PC, type (BR, ALU, ...), reg src/dst specifiers
    - Dynamic Info: results, LD/ST addresses, branch outcomes

Overview (cont.)

- Budget: (64K + 256) bits; no attempt to assess other costs (power, latency, design effort, ...)
- Performance: TK/NT accuracy only; accuracy in mispredicts per 1000 inst
- Competition has 2 rounds:
  - Initial: 6 predictors w/ lowest avg mispredict rate on distributed trace set selected as finalists
  - Final: Finalists ranked and champion declared using the undistributed trace set

Agenda

1:00 ***Introduction: Competition Overview and Workshop Agenda,*** Jared Stark, *MRL/MTL Intel*

1:10 ***Perceptrons for Dummies***, Daniel A. Jiménez, *Rutgers University*

1:30 ***Idealized Piecewise Linear Branch Prediction***, Daniel A. Jiménez, *Rutgers University*
1:50 ***A PPM-like, Tag-based Predictor***, Pierre Michaud, *IRISA/INRIA*
2:10 ***Adaptive Information Processing: An Effective Way to Improve Perceptron Predictors***
Hongliang Gao and Huiyang Zhou, *University of Central Florida*

2:30 Break

3:00 ***A 2bcgskew Predictor Fused by a Redundant History Skewed Perceptron Predictor***
Veerle Desmet, Hans Vandierendonck, and Koen De Bosschere, *Ghent University*
3:20 ***The O-GEHL Branch Predictor***, André Seznec, *IRISA/INRIA*
3:40 ***The Frankenpredictor***, Gabriel Loh, *Georgia Institute of Technology*

4:00 ***Branch Prediction Caveats and Second-Order Effects***, Phil Emma, *IBM Research*

4:20 ***Conclusion: Ranking of the Finalists, Anointing of the Champion, and "What Next?"***
Chris Wilkerson, *MRL/MTL Intel*

4:30 Adjourn