

HPCA Industrial Perspectives Panel

New Opportunities for Computer Architecture Research: An Industrial Perspective

Future of HPCA Research



- The underlying technology is presenting significant roadblocks.
- The applications used by mainstream researchers are out of synch with those used by the real world.
- The potential impact of our work seems to be uncertain.

The Panel

- Organizers:
 - Wen-Mei Hwu, *UIUC*
 - Sanjay J. Patel, *UIUC*
- Panelists:
 - Tim Chou, *Oracle*
 - Peter Hofstee, *IBM*
 - Emmett Kilgariff, *NVIDIA*
 - Chuck Moore, *AMD*
 - Justin Rattner, *Intel*



Some Seeds for Discussion

- Important technological constraints that affect architecture, with emphasis on those not already understood by the community.
 - For example, what does process variability mean for architects?
- New emerging application domains, or overlooked existing domains, and in what manner computer architecture research can help those domains.
 - This also includes new ways of using computing such as utility computing as well potential user models such mobile computing in future cell phones, etc.
- Architectural opportunities such as new forms of programming models, memory models, multi-core/hybrid architectures, speculation, threading..
 - Insight on techniques that work, and those that don't.

More Seeds for Discussion

- Economic forces that are shaping the industry. Will more or fewer companies care about architecture in the future?
 - Will there be enough companies designing chips and systems to warrant more research?
 - What does off shoring mean for computer architecture research in the US?
- Tools. What sorts of tools development should the research community tackle? Methodology?
 - In what manner can the research community provide solutions to evaluation/methodology problems?
- Your vision on the computing system of 2015. What sort of research will it take to get there?

Tim Chou

- Most recently the President of Oracle Oracle on Demand.
 - Oracle On Demand serves Fortune 500 customers as well as those in the mid-market around the world.
- Chief Operating Officer of Reasoning, Inc.,
- Ran NT product line for Oracle and as an IT services provider.
- Worked at Tandem on dependable computing before his move to Oracle.

Peter Hofstee

- Architect of the Synergistic Processor Element on Cell.
- Previously on the faculty at Caltech.
- In 1996, he joined the IBM Austin Research Laboratory where he worked on the world's first 1GHz CMOS integer microprocessor (ISSCC 1998).
- In 2001 Dr. Hofstee was one of the founding members of the joint Sony-Toshiba-IBM design center in Austin to develop the next generation of microprocessors for the broadband era: "Cell".