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 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".