

## Design Futures – predictions?

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## Some Context

- **CANDE (USA) has been doing predictions for EDA since the 1980s**
  - (CANDE = Computer Aided Network *DE*sign Committee)
  - Part of IEEE CAS among others
- **The success rate has been better than 50% (but not *much* better than that)**
- **The most recent predictions were in 2005 – let's take a look – what do *you* think?**



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## CANDE Predictions 2005

- 1. IC-Package CAD will be a part of standard design flow
- 2. India & China will have more EDA startups than U.S.
- 3. Analog Designers will still resist higher level models and languages
- 4. Complete Open Source RTL-GDS flow
- 5: Nearly all EDA tools will take advantage of multiprocessors
- 6: Fewer than 200 commercial chips will have been released in 45 nm technology
- 7: No practical nanotech computing products
- 8: Spice type simulators will still be the workhorse of analog designs
- 9: Moore's law will be dead
- 10: System in Package will boom



## CANDE 2001 predictions

- 1. Power consumption considerations will dominate all parts in high end and portable designs
- 2. At least 2 of the top 4 EDA companies will not be in the top 4
- 3. The design culture gap between architects and designers is a major problem
- 4. Speech recognition will be a major user interface in electronic systems
- 5. Generic fabrics that allow mask reuse with only a few custom masks will be popular again
- 6. HW/SW co-design is irrelevant! The real problem is SW/SW codesign - the optimal mapping of system function onto appropriate programmable processing resources and associated communications resources.(Note that programmable processing resources includes programmable processors, reconfigurable logic, and multi-function HW IP blocks)
- 7. A language question/war will still be unresolved
- 8. ASIC design styles will be largely replaced by highly programmable platforms
- 9. Integration of synthesis, placement and route will displace corresponding, independent point tools
- 10. Signal integrity will displace timing



## CANDE predictions 1986 (20 years ago)

- 1. UNIX will be the dominant operating system
- 2. General Purpose Parallel machines will replace today's computers; they will be designed for high performance on major CAD algorithms (e.g. SPICE, Logic Synthesis, Fault Simulation, Simulated Annealing, Device Simulation)
- 3. The big problem for CAD will become the validation of specifications
- 4. The major developments in CAE/CAD will be in the environments for users
- 5. The test problem will still be considered NP-hard, boring, and unsolved
- 6. Many CAD tools will finally use hierarchy effectively
- 7. General silicon compiler not developed yet but targeted silicon compiler for DSP and other specific applications will be in general use
- 8. SPICE will still be the standard circuit simulator
- 9. CAD Tools will increasingly take into account statistical fluctuations in the manufacturing process
- 10. Full hand-crafted custom will still be an important part of design



## My 5 year Predictions for EDA...

- Cadence DF will still be the IC design flow of choice *and it will be still as bad to use as ever*
- There will be no great breakthrough in EDA technology
- SPICE will still be the analogue simulator of choice (see 1986!)
- Yield will be the number one issue for designers (again see 1986!)



## So what's my long term *design* prediction?

- **Bio Inspired architectures will be the hardware platform of choice by 2017 (10 years out)**
- **What does this mean?**
  - Evolved Hardware *and* Software will be prevalent
  - “Copied” bio-inspired techniques will be common-place
  - Systematic design will be replaced by bio-inspired techniques
  - Von Neumann Architectures will be redundant
  - Neuron Networks will be at the heart of most computers

