

Computer Architecture

Simon Moore



UNIVERSITY OF
CAMBRIDGE

Computer Laboratory

Computer Architecture Group

<http://www.cl.cam.ac.uk/research/comparch/>

Ph.D. Advisors

- Simon Moore

- massively parallel architectures
- FPGA modelling/prototyping



- Robert Mullins

- chip multiprocessors
- Loki – shape shifting hardware



Challenges

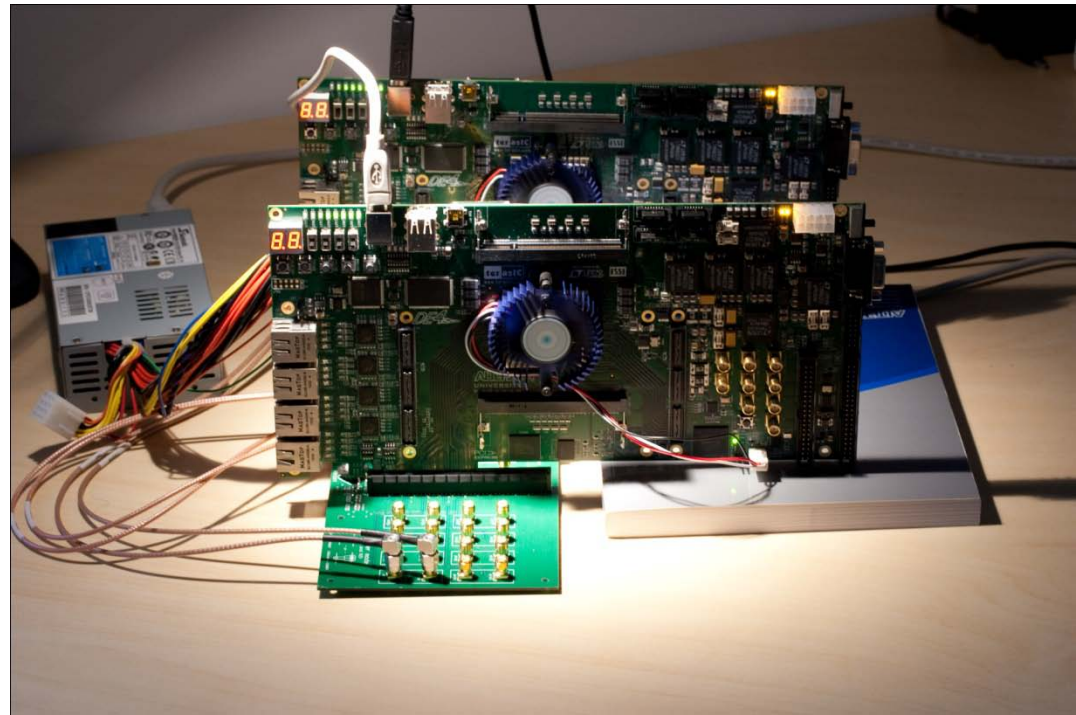
- massively parallel
 - how to roll out parallel architectures and languages
- power
 - must do more work for less power
 - “dark silicon”
 - but the implementation technology is helping much less now
- communication centric design
 - technology scaling favors transistors over wires en masse?

Funding Available

- With Robert Mullins:
 - EPSRC/ARM CASE award.... TITLE???
- With Simon Moore
 - 1 Ph.D. studentship on Biologically Inspired Massively Parallel Architectures (BIMPA)
 - Microsoft funding bid in on multithreading and message passing
 - Possible project need on DARPA funded project looking at clean slate design of resilient, adaptive, secure hosts (includes architecture, OS, lang., etc.)

Research “Sandpit”

- Well funded group (studentships, travel, kit...)
- Lots of servers, ECAD tools, etc.
- Building FPGA “supercomputer” with 100+ DE4 boards



Masters Modules

- Chip Multiprocessors (Robert Mullins)
 - learn about the latest computer architecture techniques
- Advanced Computer Design (Simon Moore)
 - learn about Bluespec SystemVerilog and how to rapidly prototype computer systems on FPGA
- Many other related modules, e.g. Build an Internet Router (Andrew Moore)

Questions?