

Arquitetura de Computadores II

Rodolfo Azevedo

MO601



Goal

- This course will cover computer microarchitecture and tools for research
- Including:
 - Modern simulators
 - Benchmarks for single/multi-cores and clusters
- Recent papers on the area and how they model:
 - Pipelines
 - Caches
 - Execution engines
 - Power evaluation



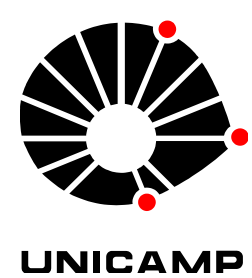
Bibliography

- **Processor Microarchitecture: An Implementation Perspective.** Antonio González, Fernando Latorre and Grigorios Magklis. Synthesis Lectures on Computer Architecture. Morgan & Claypool Publishers.
- **Modern Processor Design: Fundamentals of Superscalar Processors.** John Paul Shen, Mikko H. Lipasti. Waveland Press. 2013.
- Recent papers and presentations in the area



Grading

- 2 written exam
 - 60% of final grade
- Projects
 - 40% of final grade
 - One per month covering different tools
- *Any unethical behavior related to the evaluation process will result in failing the course with the lowest possible grade.*
- ***Every assignment is an individual assignment unless otherwise mentioned.***
- *Students are not expected to talk to each other about solutions to the assignments unless otherwise mentioned.*



Calendar

- 4 projects due to the end of each month
- Exams
 - October 14th
 - December 5th
- Holidays and no class → web page
 - <http://www.ic.unicamp.br/~rodolfo/mo601>



Benchmarks

- CloudSuite
- CSiBE – Code Size
- DaCapo
- HPCC
- Mantevo
- MediaBench
- MiBench
- MineBench
- NAS NPB
- NAS OMP
- Parsec
- Rodinia
- San Diego Vision Benchmark Suite
- Single source benchmark
- SPEC
- SpecJBB
- SpecJVM
- SPECWeb
- Streamit
- Sysbench
- TPC



Tools

- ArchC
- Cacti
- Eztrace
- FabScalar
- Gem5
- gprof
- Leon
- MARSSx86
- Mcpat
- PAPI Performance Monitoring Tool
- perf
- Pin
- Plasma
- Qemu
- Running Average Power Limits (RAPL)
- Sesc
- Simpoint



Registration

- Due to Aug 24th 10AM
- You should send me an email containing
 - Your student ID (RA) number
 - Address of one git repository for your deliverables through the semester
 - Inside this repository you should put a file named README containing your full name, email and RA. Ex.:
bitbucket.org
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First Project

- Count the number of instructions in each SPEC 2006 benchmark programs execution
- Tools required:
 - PIN
 - SPEC
- Questions:
 - Is there any variation?
 - How long should it take?
 - How long did it take?
- Do something else with this infrastructure
 - Show me that you have learned how to use PIN (create a pintool)
- Formal description in the course page
- Deadline: September 16th



Lets Work!

- Pick one of the papers in my table
- Do you find anything interesting on this paper?
- Prepare to talk about it for 2 minutes