gem5 Workshop 2023

Welcome Presentation

Presentation by Bobby R. Bruce
It’s great to see y’all here

The high-level agenda:

• 20 presentations.
• A panel Session: “The Future of gem5”.
• Poster session.
• Awards.

House keeping:

• Coffee Break: 11:00 – 11:20
• Lunch: 12:30 – 14:00
• Coffee Break: 15:30 – 16:00
• Closing: 17:00

https://www.gem5.org/events/isca-2023
Most important thing: WiFi

Network: FCRC2023
Password: fcrc23ACM
Why are we here?

- The leading open-source computer-system architecture simulator.
- Over 20,000 commits, over 450,000 lines of code.
- Over 1,000 commits in the last year.
- Distributed development: Industry, Academia, Research Labs, anyone,
Why are we here?

The purpose of the gem5 Workshop is to give members of the gem5 community to meet in person, share their work, and discuss and plan for the future of gem5.
What’s happened since we last met?

A small selection of noteworthy achievements.
What’s happened since we last met?

The 2022 Bootcamp

• 50 attendees.
• 5 Full days.
• A comprehensive course on gem5.
• Hosted at UC Davis, all expenses paid.

Feedback received:
• 95% “strongly agreed” that the Bootcamp was valuable in getting started with gem5.
• 95% “agreed” or “strongly agreed” that the Bootcamp helped them accomplish their research goals.
• 81% were “more confident” or “much more confident” in modifying gem5.
What’s happened since we last met? *GPU-FS*
What’s happened since we last met?  
*Simpoint/Looppoint*
What’s happened since we last met?
*Simpoint/Looppoint*

0
1B
2B
3B

Zhantong to talk about this at 9:40
What’s happened since we last met?

All/gem5

MIPS

ARM

POWER

SPARC

X86

RISCV

pre-Version 22.1

Version 22.1+
What’s happened since we last met?

Started “Known Good Configs”

SiFive Unmatched Board

RISCV Matched Board
What’s happened since we last met?

**Simulator Module**

The Simulator module loads a simulation and can be configured by the user to handle Simulation loop Exits to perform useful functionality. E.g., create a Checkpoint.
What’s happened since we last met?

**gem5 Resources Improvements**

Resources data now stored primarily in a Mongo Database.

https://resources.gem5.org
What are we working on?

A sneak peek of features to come.
What are we working on?

Multiprocessing

gem5 Config

gem5 orchestration framework
What are we working on?

*gem5Art Revival*

- Automatically log the state of a simulation.
- Enables reproduction of a simulation.
- Completely recreate a simulation run via a standardized definitions of a simulation.
- Better manage simulation outputs (a cleverer “m5out”).
What are we working on?

*RISC-V Vector Extensions*

![Diagram of RISC-V Vector Extensions](image)
What are we working on?
More Known Good Configs
Announcement!

We have positions available!

Joint MIT-UC Davis postdoc to model systems over time:
https://tinyurl.com/mit-ucd-pd

Full-time software developer position at UC Davis coming soon