# 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

gem5

# Most important thing: WiFi

Network: FCRC2023
Password: fcrc23ACM

gem5

# Why are we here?

- The leading open-source computer-system architecture simulator.
- Officially released 2011 (though merger of m5, 2002, and GEMS, 2000).
- 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.
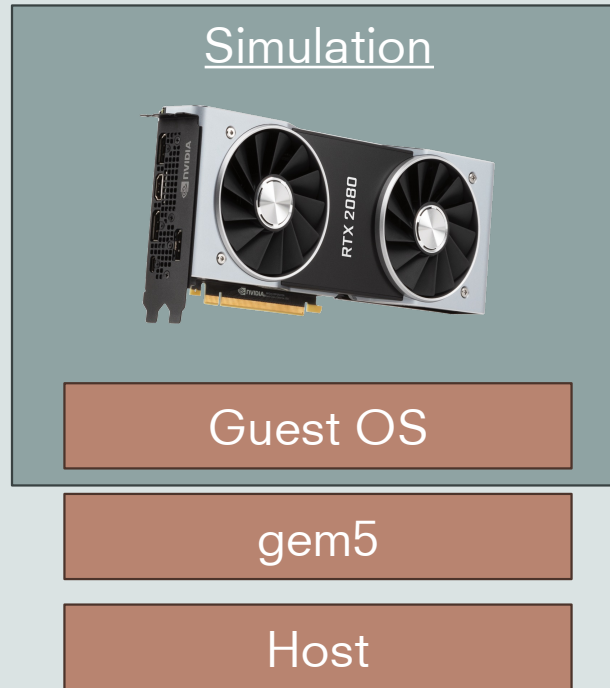- Hosted at UC Davis, all expenses paid.



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*

0

4B

# What's happened since we last met?
## *Simpoint/Looppoint*

0                1B                2B                3B
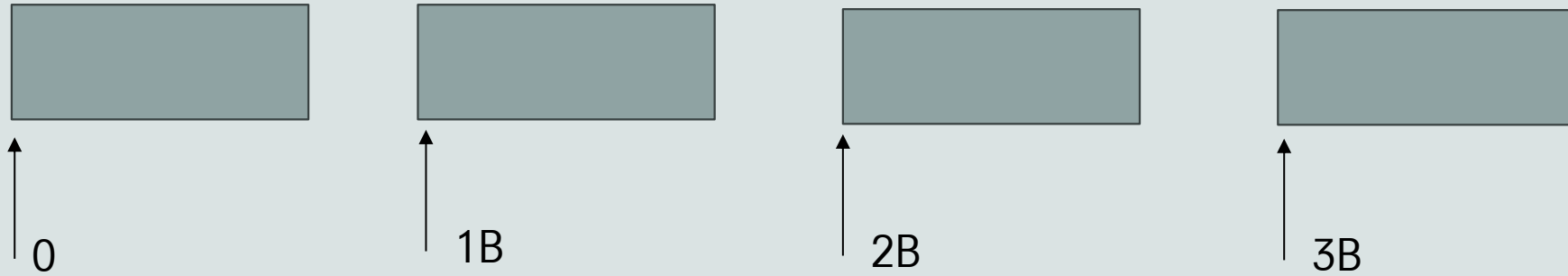
Zhantong to talk about this at 9:40

gem5

# What's happened since we last met?
## *All/gem5*



MIPS

ARM

POWER

SPARC

X86

ALL

RISCV

pre-Version 22.1

gem5

Version 22.1+

# What's happened since we last met?
## *Started "Known Good Configs"*
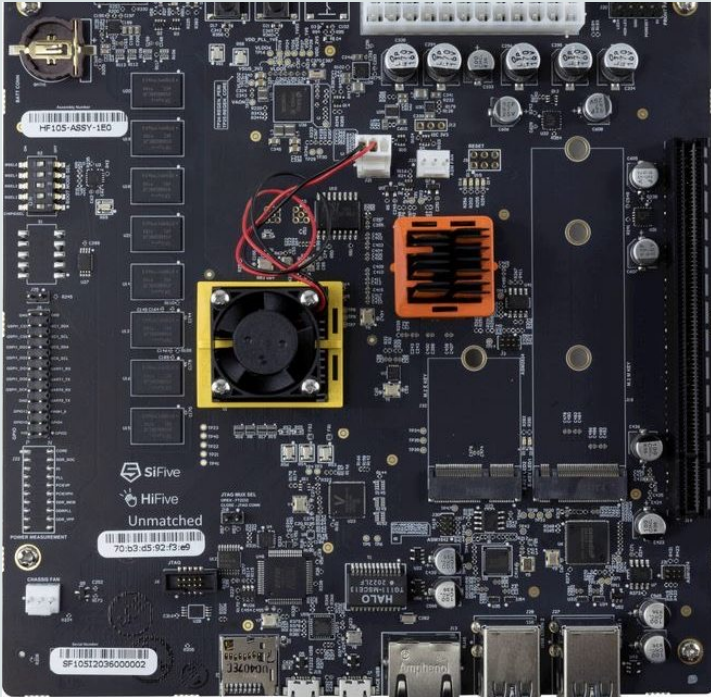


SiFive Unmatched Board
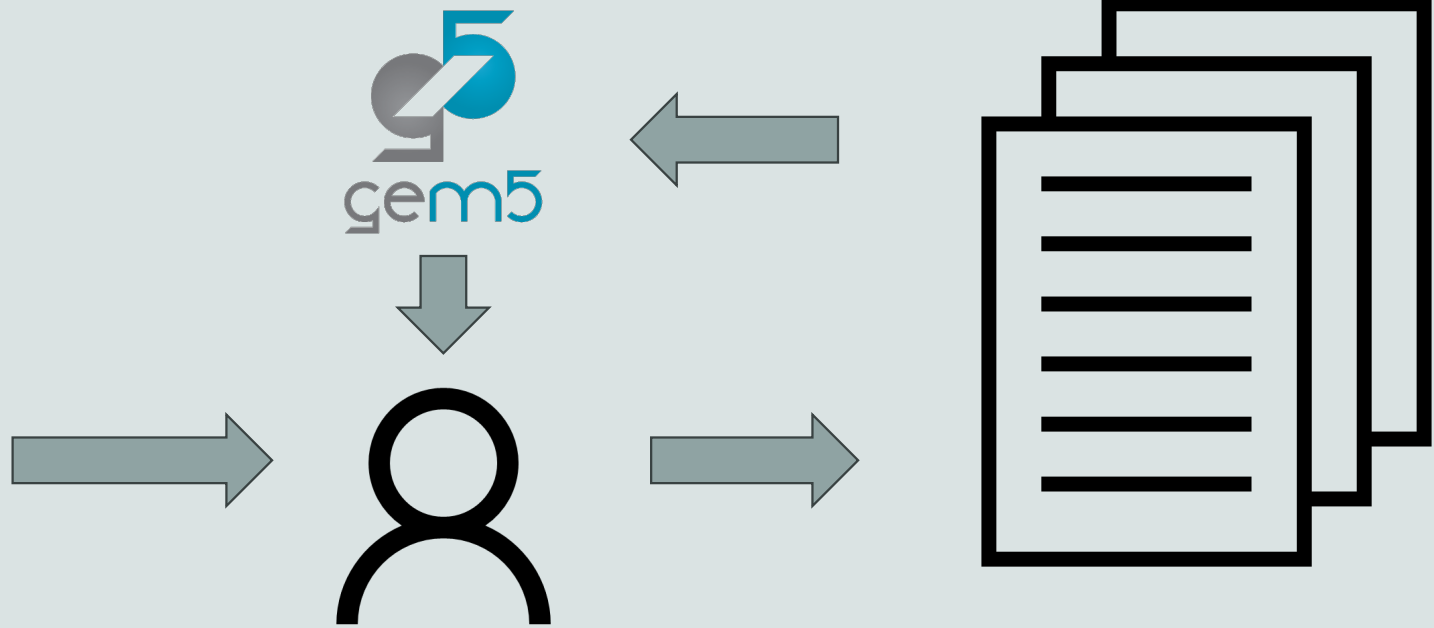
RISCV Matched Board

# What's happened since we last met?
## *Simulator Module*



Simulation Loop

Simulator

Load

Exit Events
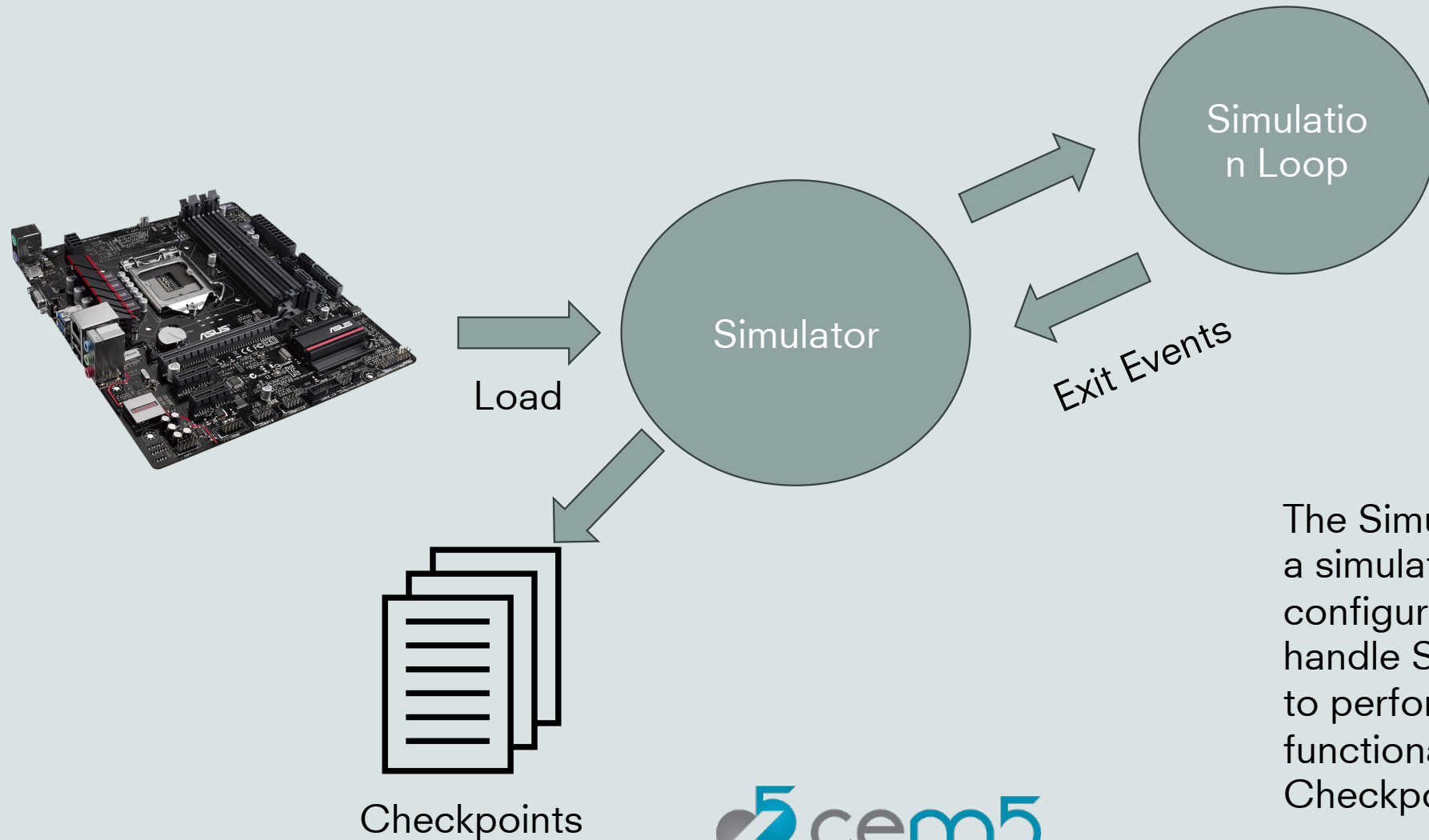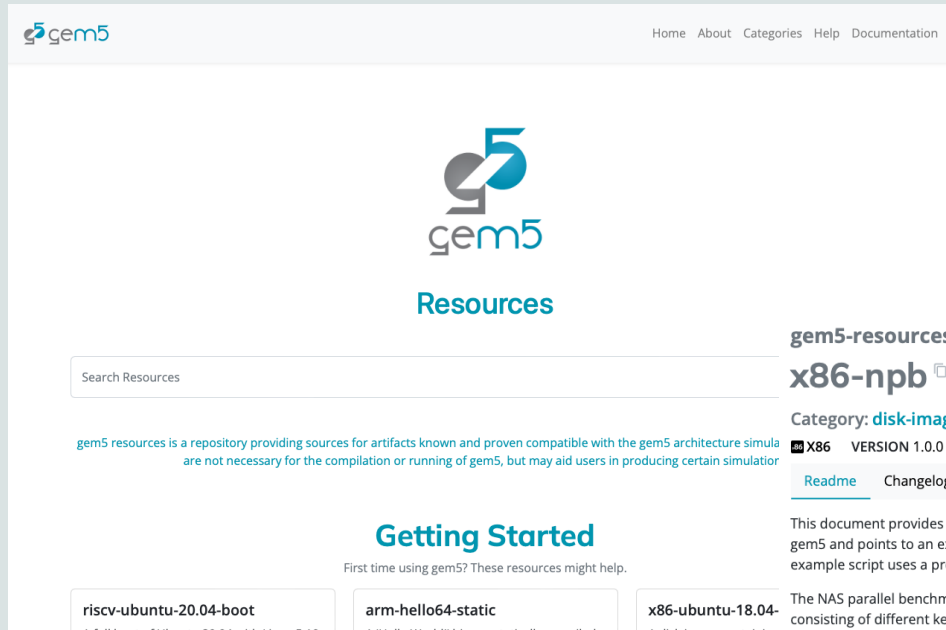
Checkpoints

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.
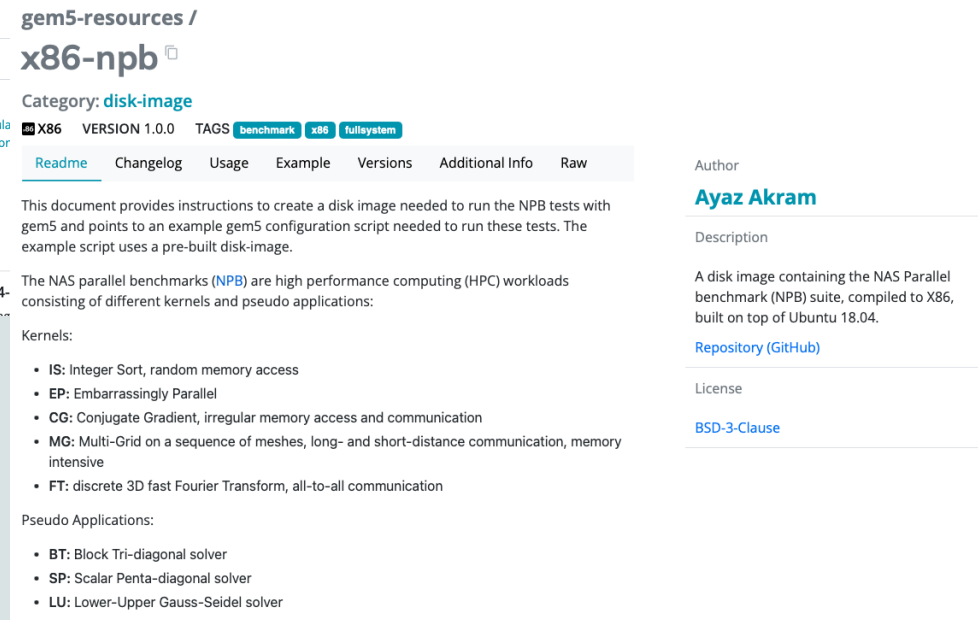
gem5

# 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.*

gem5

# What are we working on?
## *Multiprocessing*



gem5 Config

gem5 orchestration framework
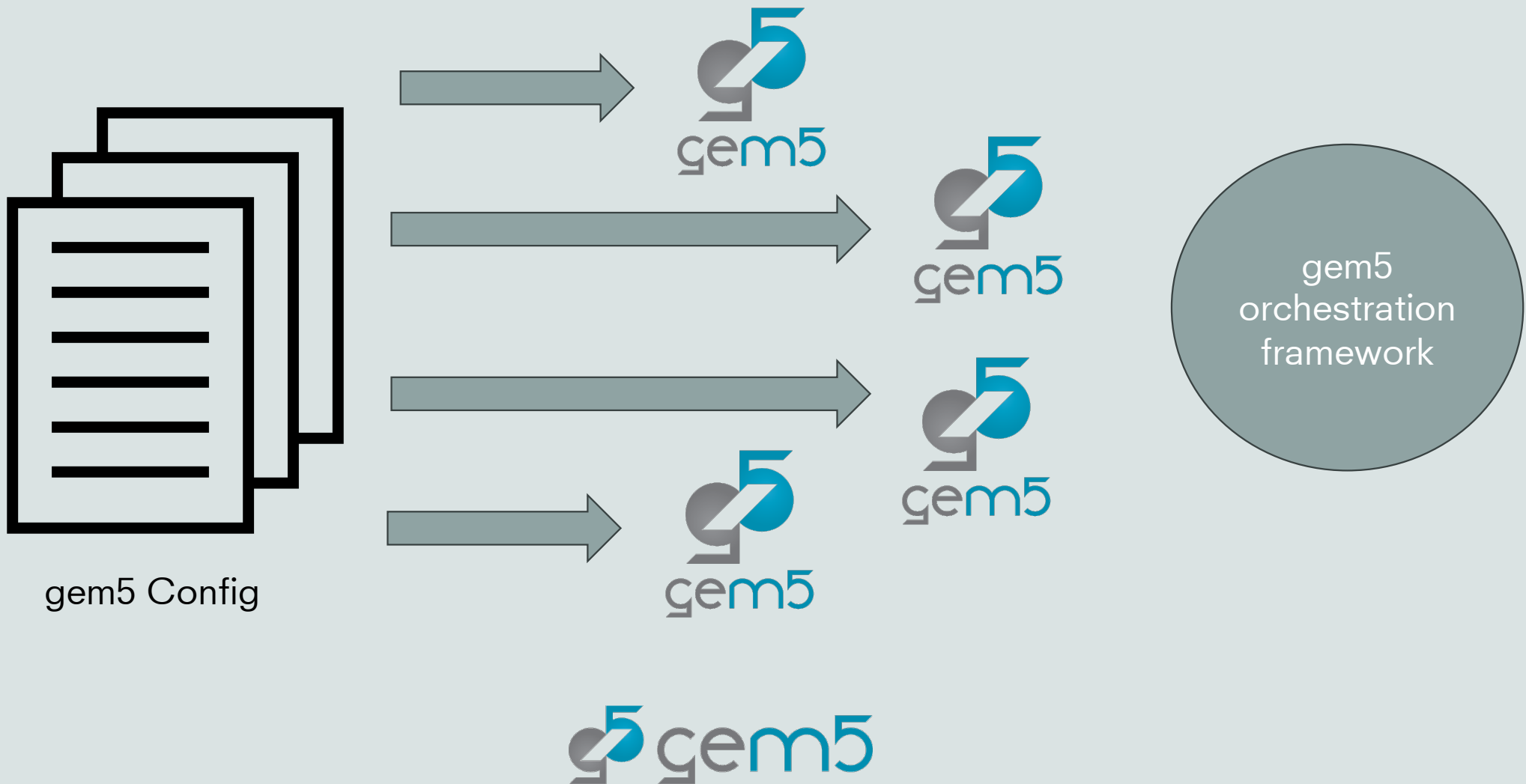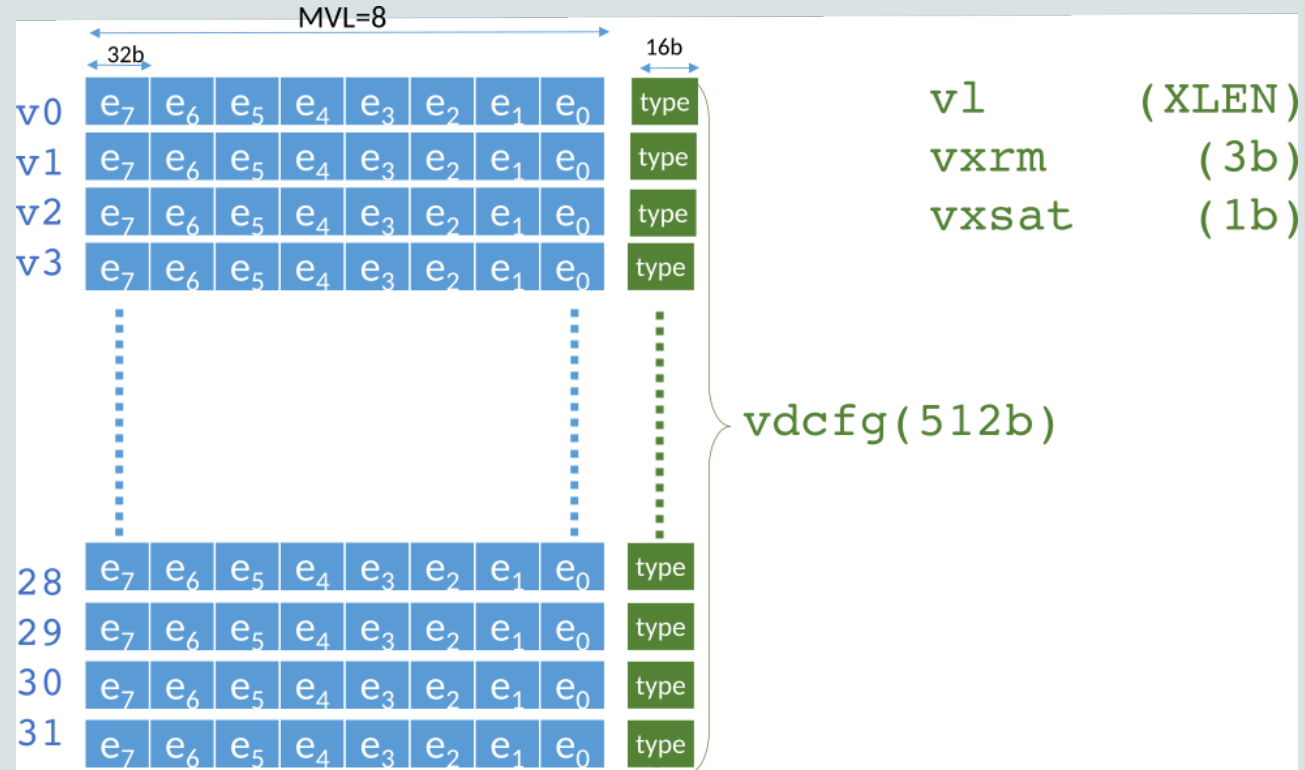
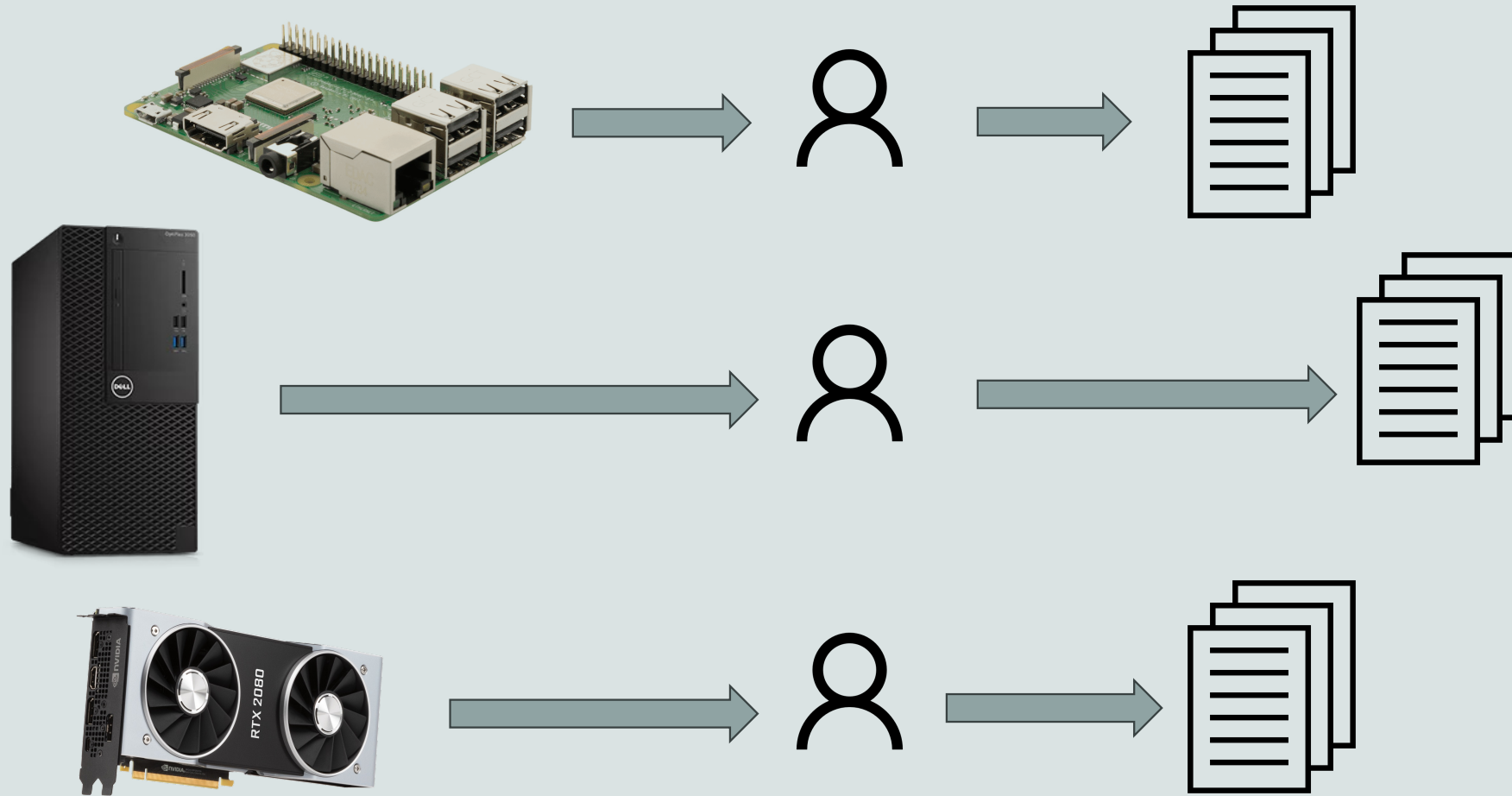# What are we working on?
## *gem5Art Revival*



- 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*

# 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
https://arch.cs.ucdavis.edu/projects/investigating-performance

Full-time software developer position at UC Davis coming soon