Welcome to the gem5 bootcamp!

# About the overall structure of the bootcamp

These slides and are available at [https://gem5bootcamp.github.io/lps2024](https://gem5bootcamp.github.io/lps2024) for you to follow along.

The source for the slides, and what you'll be using throughout the bootcamp can be found on github at [https://github.com/gem5bootcamp/lps2024](https://github.com/gem5bootcamp/lps2024)

> Note: Don't clone that repo, yet. We'll do that in a bit.

# A bit about us

I am **Prof. Jason Lowe-Power** (he/him).
I am an associate professor in the Computer Science Department and
the *Project Management Committee chair* for the gem5 project.

I lead the Davis Computer Architecture Research (DArchR) Group.

https://arch.cs.ucdavis.edu

I am **Dr. Bobby Bruce** (he/him).
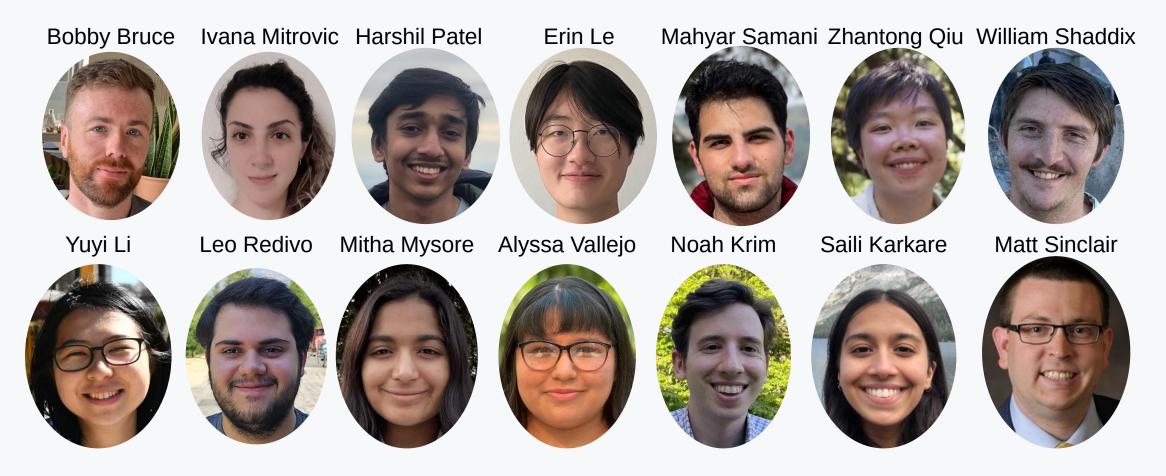I am a project scientist in the Computer Science Department at UC Davis.
I am the *lead maintainer* of the gem5 project.

# The bootcamp team

Bobby Bruce

Ivana Mitrovic

Harshil Patel

Erin Le

Mahyar Samani

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William Shaddix

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Matt Sinclair

gem5

# Plan for the week

## Tuesday

Introduction
- [Background on simulation](#)
- [Getting started with gem5](#)

Using gem5
- [gem5's standard library](#)
- [gem5 resources](#)
- [Running things in gem5](#)
- [Modeling cores in gem5](#)
- [Modeling caches in gem5](#)
- [Modeling memory in gem5](#)

## Wednesday

Using gem5
- [Full system simulation](#)
- [Accelerating simulation](#)
- [Sampled simulation with gem5](#)
- [Power modeling](#)
- [Multisim](#)

Other simulators
- [SST](#)

Developing gem5 models
- [SimObject intro](#)
- [Debugging and debug flags](#)
- [Event-driven simulation](#)
- [Ports and memory-based SimObjects](#)

## Thursday

Developing gem5 models
- [Modeling Cores](#)
- [Modeling cache coherence with Ruby and SLICC](#)
- [Using the CHI protocol](#)
- [Modeling the on-chip network with Garnet](#)

# Our goals for the gem5 bootcamp

- Make gem5 less painful and flatten the learning curve
- Give you a vocabulary for asking questions
- Provide a reference for the future
- Give you material to take back and teach your colleagues

## Other likely outcomes

- You will be overwhelmed by the amount of information and how large gem5 is
  - That's OK! You can take these materials with you and refer back to them
- You will not understand everything
  - That's OK! You can ask questions as we go

# How this is going to work

- We'll be going mostly top-down
    1. How to use gem5
    2. How to each model can be used
    3. How to develop your own models and modify existing models
- Highly iterative:
    - You'll see the same thing over and over
    - Each time it will be one level deeper
- Lots of coding examples
    - Both live coding and practice problems

# Coding examples

You can write the following code

```python
print("Hello, world!")
print("You'll be seeing a lot of Python code")
print("The slides will be a reference, but we'll be doing a lot of live coding!")
```

And you'll see this output.

```
Hello, world!
You'll be seeing a lot of Python code
The slides will be a reference, but we'll be doing a lot of live coding!
```

# Bootcamp logistics

# Important resources

## Bootcamp links

- Bootcamp website (Maybe you're here now)
  - Bootcamp archive (If you're coming to this later)
- Source for bootcamp materials (You'll work here)
- GitHub Classroom (Needed to use codespaces)

## gem5 links

- gem5 code
- gem5 website
- gem5 YouTube
- gem5 Slack (for asking offline questions)