

CSE 291: Operating Systems in Datacenters

Amy Ousterhout

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Agenda for Today

- Announcements
- Project write-ups
- Intro to miscellaneous topics
- OS Verification
- Reducing Embedded Carbon

Announcements

- Project presentations
 - In class next week (12/5 and 12/7)
 - Sign up on Canvas
- Course evaluations
 - Please fill these out – feedback is very helpful!
 - Due Saturday December 9th at 8:00 am
- Project write ups
 - Due Thursday December 14th at 11:59 pm

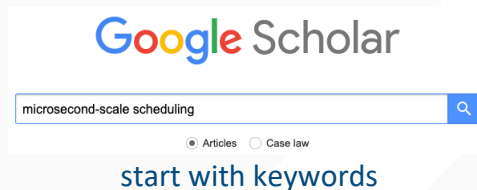
Project Write-Ups

Project Write-Ups

- 5-7 pages, depending on group size
- Similar content and structure as papers from class
 - Introduction, background, evaluation, related work, etc.
- Should provide more detail than your presentation
- Key differences:
 - Describe both what worked and what didn't work
 - Describe what steps you would take next to continue the work
- See doc on Canvas for details

Tips for Finding Related Work

- How do you find the most related work on a topic?
- Use Google Scholar
 - E.g., what's the most relevant work about CPU scheduling?



find most relevant papers

microsecond-scale scheduling

About 1,010 results (0.03 sec)

(RackSched): A (Microsecond-Scale) Scheduler for (Rack-Scale) Computers
H. Chen, B. Kang, Z. Chen, Z. Liu, K. Zou - USENIX Symposium on ..., 2020 - usenix.org
... We propose RackSched, the first rack-level **microsecondscale scheduler** that ... **scheduling** framework that integrates **inter-server scheduling** in the ToR switch and **intraserver scheduling** ...
☆ Save Cite Cited by 45 Related articles All 7 versions

Achieving Microsecond-Scale Tail Latency Efficiently with Approximate Optimal Scheduling
R. Iyer, M. Unal, M. Kogias, G. Candea - Proceedings of the 29th ..., 2023 - dl.acm.org
..., a **scheduling** runtime for **microsecond-scale** applications ...) of optimal **scheduling** policies enables new **microsecondscale** ... Thus, Concord does not introduce new **scheduling** policies. ...
☆ Save Cite Cited by 1 All 3 versions

Efficient scheduling policies for (Microsecond-Scale) tasks
S. McClure, A. Ousterhout, S. Shenker - ... USENIX Symposium on ..., 2022 - usenix.org
Datacenter operators today strive to support microsecond-latency applications while also using their limited CPU resources as efficiently as possible. To achieve this, several recent ...
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what papers did this paper cite?

what papers have cited this paper?

Iterate until you converge on a set of relevant papers

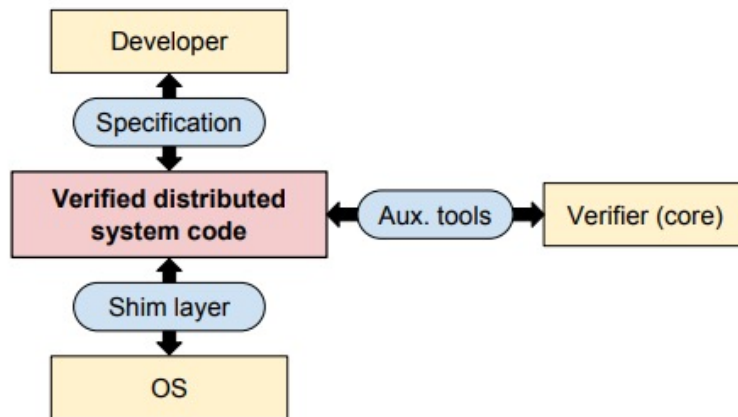
Miscellaneous Topics

Workshop vs. Conference Papers

- Workshop papers tend to be earlier stage work. They might:
 - Identify fundamental open questions
 - Critique the status quo
 - Advocate for a new approach or research direction
 - Debunk existing work
 - Report experience from real deployments
 - Describe promising new research directions
- Emphasis is on exploring new and exciting ideas
- Papers don't typically include a full implementation and evaluation

Formal Verification

- It's hard to write bug-free code!
- Can we prove that our code is correct?
- Typical components of verification:



Datacenter Energy Consumption

- Datacenters consume huge amounts of energy
 - Responsible for 2% of global energy use today
 - Increasing concerns about the carbon emissions from datacenters



Microsoft datacenter in Wyoming



Meta datacenter in Texas

Carbon Emissions

- Types of carbon emissions:
 - Embodied carbon – emissions from manufacturing devices



- Operational carbon – emissions from using the device



**Beyond Isolation Discussion
Myths and Misconceptions Around Reducing
Carbon Discussion**