

# Zhongrui Chen

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## EDUCATION

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**University of North Carolina at Chapel Hill** 2022/08–Present  
*Ph.D. in Computer Science (Advisor: Benjamin Berg)*

**University of North Carolina at Chapel Hill** 2018/08–2022/05  
*B.S. in Computer Science, B.S. in Mathematics*

## RESEARCH INTERESTS

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Performance Evaluation, Queueing Theory, Scheduling, Caching, Operating Systems

## PUBLICATIONS

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- **Zhongrui Chen**, Heyuan Yao, Isaac Grosf, Benjamin Berg. “Non-Preemptive Datacenter Scheduling via Scaling Cycles.” *MAMA. ACM SIGMETRICS Performance Evaluation Review 2026*. 2026/06.
- **Zhongrui Chen**, Adityo Anggraito, Diletta Olliaro, Andrea Marin, Marco Ajmone Marsan, Benjamin Berg, Isaac Grosf. “Improving Nonpreemptive Multiserver Job Scheduling with Quickswap.” *IFIP Performance 2025, PEVA 2025*. 2025/08.
- **Zhongrui Chen**, Isaac Grosf, Benjamin Berg. “Improving Multiresource Job Scheduling with Markovian Service Rate Policies.” *ACM SIGMETRICS 2025, POMACS 2025*. 2025/06.
- **Zhongrui Chen**, Isaac Grosf, Benjamin Berg. “Simple Policies for Multiresource Job Scheduling.” *MAMA. ACM SIGMETRICS Performance Evaluations Review 2024*. 2024/04.

## TALKS

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- 2025/11** “Improving Nonpreemptive Multiserver Job Scheduling with Quickswap.” IFIP PERFORMANCE 2025. Amsterdam, NL.
- 2025/07** “A New Class of Policies for Multiresource Job Scheduling.” INFORMS APS. Atlanta, GA.
- 2025/06** “Improving Multiresource Job Scheduling with Markovian Service Rate Policies.” ACM SIGMETRICS 2025. Stony Brook, NY.
- 2025/04** “A New Class of Policies for Multiresource Job Scheduling.” Queueing Seminar at Northwestern University. Evanston, IL.
- 2024/10** “Simple Policies for Multiresource Job Scheduling.” INFORMS. Seattle, WA.
- 2024/06** “Simple Policies for Multiresource Job Scheduling.” SIGMETRICS MAMA Workshop. Venice, Italy.

## AWARDS

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- SIGMETRICS Student Travel Grant (\$1750 (2024), \$750 (2025))
- OSDI Student Travel Grant (\$625 (2025))

## ACADEMIC SERVICE

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- Shadow PC, ACM SIGMETRICS 2026 (Winter)
- External Reviewer, ACM SIGMETRICS 2025 (Fall)
- Ad-Hoc Reviewer, ACM SIGMETRICS 2025 (Summer, Winter), WWW 2024

## RESEARCH EXPERIENCE

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**Graduate Research Assistant** **2022/08–Present**

*UNC Chapel Hill, Advised by Benjamin Berg*

### **Non-Preemptive Datacenter Scheduling**

- Developed “Scaling Cycles,” a novel framework for non-preemptive scheduling in large-scale datacenters to optimize resource utilization and response time (MAMA ’26).
- Introduced the “Quickswap” mechanism to improve performance in non-preemptive multi-server systems by enabling efficient resource reclamation (IFIP Performance ’25).

### **Multiresource Job Scheduling**

- Proposed Markovian Service Rate (MSR) policies, a new class of low-complexity, throughput-optimal scheduling policies for multiresource jobs (SIGMETRICS ’25, MAMA ’24).
- Proved stability and analyzed the mean response time of MSR policies using queueing-theoretical techniques.
- Validated policies using discrete event simulations and cluster traces from Google Borg.

### **LLM Inference Workload Scheduling**

- Investigated how to colocate the compute-bound prefills and memory-bound decoding stages of LLM inference workloads to optimize latency and resource utilization.

**Undergraduate Honors Thesis** **2021/08–2022/05**

*UNC Chapel Hill, Advised by Praneeth Chakravarthula*

- Developed numerical methods to infer the underlying dynamics of physical systems from sparse and limited observations.
- Leveraged physics-aware neural networks for high-fidelity video interpolation and extrapolation of complex physical phenomena.
- Built custom physical simulators to generate large-scale datasets for training and validating physics-informed learning models.

**Undergraduate Research Assistant** **2021/01–2021/06**

*UNC Chapel Hill, Advised by Henry Fuchs*

- Developed a pipeline for reconstructing novel views of human faces from a single input image using differentiable rendering.
- Integrated PyTorch3d for mesh fitting and implemented a variational autoencoder (VAE) with a texture decoder to synthesize high-quality texture maps.
- Optimized the training infrastructure by implementing data pre-fetching and bottleneck analysis, resulting in a 10x speedup and elimination of memory leaks.

**Mentored Research** **2020/08–2020/12**

*UNC Chapel Hill, Advised by Jasleen Kaur*

- Conducted a comprehensive survey of classical and modern congestion control algorithms, analyzing their theoretical contributions and practical limitations.
- Investigated the game-theoretic foundations of congestion control, focusing on the formulation of network protocols as socially concave games.
- Evaluated fairness metrics and analyzed scavenger protocols to understand their impact on background data transfer in heterogeneous networks.

## TEACHING EXPERIENCE

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**Graduate Teaching Assistant** **2025/08–2025/12**

*COMP 421 Files and Databases*

**Undergraduate Teaching Assistant** **2021/08–2021/12**

*COMP 572 Computational Photography*

Responsibilities: Grading, Office Hours

**Undergraduate Teaching Assistant**

2021/08–2021/12

*COMP 524 Programming Languages*

Responsibilities: Grading, Designing Worksheets, Office Hours

**Undergraduate Teaching Assistant**

2020/08–2021/05

*COMP 521 Files and Databases*

Responsibilities: Grading, Office Hours

**Undergraduate Teaching Assistant**

2019/08–2020/05

*COMP 411 Computer Organization*

Responsibilities: Grading, Recitation Session, Office Hours

**PROGRAMMING LANGUAGES**

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**Imperative:** C/C++, Rust, Java

**Functional:** Haskell, Lisp

**Scripting:** Python, JavaScript, Shell (and variants)

**Others:** L<sup>A</sup>T<sub>E</sub>X, HTML5/CSS3, Matlab, Mathematica