Stanford



Cynthia Bailey

Senior Lecturer of Computer Science

CONTACT INFORMATION

- **Media Inquiries**

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Bio

BIO

Cynthia Bailey is a Senior Lecturer in the Computer Science Department at Stanford University. In 2023-2024, she served as an AI Policy Fellow in the United States Senate through the American Association for the Advancement of Science (AAAS). Her scholarship focuses on computer science education, AI/machine learning, and the social impacts of technology. This work includes creating groundbreaking courses such as Equity and Governance for Artificial Intelligence and Race and Gender in Silicon Valley. Her teaching and research awards include the Lloyd W. Dinkelspiel Award for exceptional contributions to undergraduate education at Stanford, the Lasting Impact Award from the International Computing Education Research conference, a "Top 10 Papers of All Time" award at the 50th anniversary of the ACM SIGCSE Technical Symposium, and the Stanford Society of Women Engineers' Professor of the Year. She has consulted for Apple, NASA, law firms, and machine learning startups. She holds a Ph.D. in Computer Science from UC San Diego.

ACADEMIC APPOINTMENTS

- Senior Lecturer, Computer Science

HONORS AND AWARDS

- Lasting Impact Award, ACM ICER (2025)
- Teaching Honor Roll, Stanford Tau Beta Pi (2022)
- Lloyd W. Dinkelspiel Award, Stanford University (2019)
- Top 10 Papers of All Time (#4), ACM SIGCSE (2019)
- Best Paper Award, ACM SIGCSE (2016)
- Professor of the Year, Stanford Society of Women Engineers (2015)

PROFESSIONAL EDUCATION

- Ph.D., University of California, San Diego , Computer Science (2009)
- B.S., University of California, San Diego , Computer Science (2001)

LINKS

- Google Scholar Publications List: https://scholar.google.com/citations?user=m7XfezkAAAAJ&hl=en
- LinkedIn Profile: https://www.linkedin.com/in/cynthia-lee-00498a54/
- Wikipedia Page: https://en.wikipedia.org/wiki/Cynthia_B._Lee

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

I have a PhD in Computer Science from the University of California, San Diego, in the area of High-Performance Computing (HPC), specifically market-based scheduling algorithms. My graduate research was done as part of San Diego Supercomputer Center (SDSC)'s Performance Modeling and Characterization Lab (PMaC), where I investigated economic models of scheduling on high performance computing systems. My adviser was Allan Snavely of SDSC.

My dissertation abstract is as follows: Effective management of Grid and HPC resources is essential to maximizing return on the substantial infrastructure investment these resources entail. An important prerequisite to effective resource management is productive interaction between the user and scheduler. My work analyzes several aspects of the user-scheduler relationship and develops solutions to three of the most vexing barriers between the two. First, users' monetary valuation of compute time and schedule turnaround time is examined in terms of a utility function. Second, responsiveness of the scheduler to users' varied valuations is optimized via a genetic algorithm heuristic, creating a controlled market for computation. Finally, the chronic problem of inaccurate user runtime requests, and its implications for scheduler performance, is examined, along with mitigation techniques.

My current research projects are in the area of Computer Science Education, with an emphasis on assessment and the use of Peer Instruction pedagogy in lecture. With colleagues Mark Guzdial, Leo Porter, and Beth Simon, I run the New CS Faculty Teaching Workshop, an annual "bootcamp" on how to teach effectively that draws attendees from dozens of the top CS programs in the country. The short-term goal is to give newly-hired faculty entering their first year of teaching the skills they need to succeed for themselves and their students. The long-term goal is to transform undergraduate education in CS by seeding our best rising stars with best practices so they can create communities of practice as their institutions and mentor their students in active learning strategies, creating a culture where these are the new norm.

PROJECTS

- New Faculty Workshop
- Instructor tips for creating inclusive CS classrooms - Stanford University

Teaching

COURSES

2026-27

- Equity and Governance for Artificial Intelligence: CS 121 (Win)
- Programming Abstractions: CS 106B (Aut)
- Standard C++ Programming Laboratory: CS 106L (Aut)
- Thinking with AI: Strategies for Effective and Ethical Human-AI Collaboration: CS 193T (Aut, Win)

2025-26

- Equity and Governance for Artificial Intelligence: CS 121 (Aut)

- Mathematical Foundations of Computing: CS 103 (Spr)
- Programming Abstractions: CS 106B (Win)

2024-25

- Equity and Governance for Artificial Intelligence: CS 121 (Win)
- Mathematical Foundations of Computing: CS 103 (Spr)
- Programming Abstractions: CS 106B (Aut)

STANFORD ADVISEES

Master's Program Advisor

Ashley Jun, Alex Nguyen, Ose Okhihan, Jaduk Suh, Vivian (Yuejiao) Zhou

Publications

PUBLICATIONS

- **Evaluation of Peer Instruction for Cybersecurity Education**
  Deshpande, P., Lee, C. B., Ahmed, I., Assoc Comp Machinery
  ASSOC COMPUTING MACHINERY.2019: 720–25
- **BDSI: A Validated Concept Inventory for Basic Data Structures**
  Porter, L., Zingaro, D., Liao, S., Taylor, C., Webb, K. C., Lee, C., Clancy, M., Assoc Comp Machinery
  ASSOC COMPUTING MACHINERY.2019: 111–19
- **Integrating Social Justice Topics into CS1**
  Lewis, C. M., Rackoff, E., Cao, E., Khan, S., Lee, C., Garcia, S., Assoc Comp Machinery
  ASSOC COMPUTING MACHINERY.2018: 1056
- **Developing Course-Level Learning Goals for Basic Data Structures in CS2**
  Porter, L., Zingaro, D., Lee, C., Taylor, C., Webb, K. C., Clancy, M., Assoc Comp Machinery
  ASSOC COMPUTING MACHINERY.2018: 858–63
- **A multi-institutional study of peer instruction in introductory computing**
  Porter, L., Bouvier, D., Cutts, Q., Grissom, S., Lee, C., McCartney, R., Zingaro, D., Simon, B.
  ACM Inroads. New York, NY, USA .
  2016 ; Volume 7 (Issue 2): 76–81
- **Computer science concept inventories: past and future** *Computer Science Education*
  Taylor, C., Zingaro, D., Porter, L., Webb, K., Lee, C. B., Clancy, M.
  2014; 24 (4)
- **Active Learning in Lecture with Peer Instruction**
  Lee, C. B.
  AI Magazine. Association for the Advancement of Artificial Intelligence.
  2014 ; Volume 35 (2):
- **Adapting to Pervasive Computing, and Making Great Pedagogy Pervasive**
  Lee, C. B.
  National Science Foundation.
  2013 ; Future Directions in Computing Education Summit white papers
- **Can peer instruction be effective in upper-division computer science courses?** *ACM Transactions on Computing Education (TOCE)*
  Lee, C. B., Garcia, S., Porter, L.
  2013; 13 (3)
- **On the User–Scheduler Dialogue: Studies of User-Provided Runtime Estimates and Utility Functions** *The International Journal of High Performance Computing Applications*

Lee, C. B., Snavely, A.
2006; 20 (4)

- **Performance modeling of HPC applications** *Advances in Parallel Computing*
  Snavely, A., Gao, X., Lee, C., Carrington, L., Wolter, N., Labarta, J., Gimenez, J., Jones, P.
  2004; 13
- **Parallel job scheduling algorithms and interfaces**
  Lee, C.
  Department of Computer Science and Engineering. University of California, San Diego. La Jolla, CA.
  2004
- **Detection and characterization of port scan attacks**
  Lee, C. B., Roedel, C., Silenok, E.
  Univeristy of California, Department of Computer Science and Engineering. La Jolla, CA.
  2003
- **Peer instruction: do students really learn from peer discussion in computing?** *ICER '11*
  Porter, L., Lee, C. B., Simon, B., Zingaro, D.
  2011
- **Are user runtime estimates inherently inaccurate?** *Workshop on Job Scheduling Strategies for Parallel Processing*
  Lee, C. B., Schwartzman, Y., Hardy, J., Snavely, A.
- **Applying an automated framework to produce accurate blind performance predictions of full-scale HPC applications** *Department of Defense Users Group Conference*
  Carrington, L., Wolter, N., Snavely, A., Lee, C. B.
  2004
- **New CS1 pedagogies and curriculum, the same success factors?** *SIGCSE '14*
  Alvarado, C., Lee, C. B., Gillespie, G.
  2014
- **Peer Instruction for Digital Forensics** *USENIX Workshop on Advances in Security Education (ASE17)*
  Johnson, W., Ahmed, I., Roussev, V., Lee, C. B.
  2017
- **Peer instruction in computing: the role of reading quizzes** *SIGCSE '13*
  Zingaro, D., Lee, C. B., Porter, L.
  2013
- **Development of Peer Instruction Questions for Cybersecurity Education** *Advances in Security Education (ASE'16)*
  Johnson, W. E., Luzader, A., Ahmed, I., Roussev, V., Richard III, G. G., Lee, C. B.
  2016
- **Precise and realistic utility functions for user-centric performance analysis of schedulers** *ICER '11*
  Lee, C. B., Snavely, A. E.
  2007
- **Halving fail rates using peer instruction: a study of four computer science courses** *SIGCSE '13*
  Porter, L., Lee, C. B., Simon, B.
  2013
- **Experience report: a multi-classroom report on the value of peer instruction** *ITiCSE '11*
  Porter, L., Lee, C. B., Simon, B., Cutts, Q., Zingaro, D.
  2011
- **Experience report: CS1 in MATLAB for non-majors, with media computation and peer instruction** *SIGCSE'13*
  Lee, C. B.
  2013