

# JIWON CHOE

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<https://jiwon-choe.github.io>

## EDUCATION

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**Brown University**, Providence, RI, USA

08/2016 - present

**Ph.D. Candidate** in **Computer Science**

**Sc.M.** in **Computer Science** (05/2018)

*Advised by:* Professors Iris Bahar & Maurice Herlihy

*Research Interests:* The hardware-software co-design of concurrent data structures and algorithms with emerging memory technologies, such as compute-capable memory or non-volatile memory.

**Rice University**, Houston, TX, USA

08/2009 - 05/2013

**B.S.E.E.** in **Electrical Engineering**, *cum laude*

**B.A.** in **Computer Science**, *cum laude*

## PH.D. THESIS WORK

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### Concurrent Data Structures with Near-Data-Processing (NDP)

#### related publications:

Jiwon Choe, Amy Huang, Tali Moreshet, Maurice Herlihy, R. Iris Bahar. **Concurrent Data Structures with Near-Data-Processing: an Architecture-Aware Implementation**. In *31st ACM Symposium on Parallelism in Algorithms and Architectures (SPAA 2019)*.

**open-source framework:** <https://www.github.com/jiwon-choe/Brown-SMCSim>

In the *SPAA 2019* paper, NDP-based concurrent data structures that leverage the *flat-combining* synchronization scheme were implemented and evaluated on Brown-SMCSim, a gem5-based full-system NDP architecture simulator. This yielded a more realistic performance, energy, and power analysis compared to the prior theoretical analysis. However, we also show that lightweight hardware modifications can lead to significant improvements in performance and energy savings with the NDP-based concurrent data structures, without any modifications to the software.

More recently, I have been looking into how *large yet cache-friendly* concurrent data structures can be integrated with NDP, in order to take advantage of concurrency, host processor cache locality, and computation near memory.

## WORK EXPERIENCE

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**Software Engineer** at **Oracle**, Santa Clara, CA

07/2013 - 12/2015

*Single Server Management – Hardware Management Pack*

Developed cross-platform, cross-OS software for monitoring and maintaining the status of various hardware components on Oracle servers.

## HONORS & AWARDS

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- 2019 **SPAA Student Travel Grant**  
31st ACM Symposium on Parallelism in Algorithms and Architectures  
*1st author/presenter of paper at conference*
- 2018 **Cadence Women in Tech Scholarship**  
\$5,000 award for women with strong academic record and leadership/passion in technology
- 2018 **HPCA Student Travel Grant**  
24th IEEE International Symposium on High-Performance Computer Architecture
- 2013 **Tau Beta Pi**, School of Engineering, Rice University
- 2012 **Eta Kappa Nu**, ECE Department, Rice University

## TEACHING EXPERIENCE

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- ELEC 220: Fundamentals of Computer Engineering** Rice University  
*Lab Assistant* Spring 2011  
Helped organize and proceed labs on: digital logic circuits and assembly language.
- ELEC 241: Fundamentals of Electrical Engineering I** Rice University  
*Course Assistant* Fall 2011  
Held weekly help sessions for problem sets on: time and frequency domain signal analysis, analog and digital signal processing, and signal transmission.
- ELEC 242: Fundamentals of Electrical Engineering II** Rice University  
*Course Assistant* Spring 2012  
Held weekly help sessions for problem sets on: basic electronic devices, circuits, and electromechanical systems.

## PRESENTATIONS

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- 06/2019 **Concurrent Data Structures with Near-Data-Processing: an Architecture-Aware Implementation**  
*31st ACM Symposium on Parallelism in Algorithms and Architectures*
- 01/2019 **Hardware-Software Coordination for High-Performance Concurrent Data Structures with Near-Data-Processing**  
*2019 Boston Area Architecture Workshop*
- 01/2018 **Managing Concurrent Data Structures with Processing-In-Memory**  
*2018 Boston Area Architecture Workshop*
- 10/2017 **Managing Concurrent Data Structures with Processing-In-Memory**  
*Career Workshop for Women and Minorities in Computer Architecture (at MICRO 2017)*

## SERVICES

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- 2019 Student Volunteer for **ASPLOS 2019**
- 2017 Organizer for **Brown CS New Graduate Student Orientation**
- 2014-2015 Volunteer Writer for **techNeedle** (Korean online media for tech-related news)
- 2012-2013 Treasurer for **Rice IEEE Student Chapter**