

# HAOSEN WEN

(585)-490-7620 ◊ +86-18310032269 ◊ hwen5@cs.rochester.edu

Department of Computer Science, Univeristy of Rochester

Rochester, NY 14627

## EDUCATION

---

### University of Rochester, Rochester, NY

*Sep. 2016–Present*

Doctoral Student in Computer Science

Advisor: Professor Michael L. Scott

### Beijing Foreign Studies University (BFSU), Beijing, China

*Sep. 2012–Jun. 2016*

B.E in Computer Science

Overall GPA: 3.65/4.00

## INTERNSHIP

---

### Uber Technologies

San Francisco, CA

*Software Engineer Intern*

*May. 2019–Aug. 2019*

- Worked on a debugger for android applications using RxJava, a library for reactive programming.
- Learned reactive programming and IntelliJ extension development from scratch, and built a prototype as an IntelliJ plug-in within 11 weeks.

### Institute for Network Sciences and Cyberspace

Tsinghua U., China

*Research Assistant Intern*

*Aug. 2015–Jun. 2016*

- Studied traffic engineering in datacenter networks, especially in scenarios based on SDN (Software Defined Network) simulation and emulation.

## RESEARCH PROJECTS

---

### Object-based Non-blocking Persistent MCAS

U. of Rochester, NY

*Supervised by Professor Michael L. Scott*

*May. 2018–Present*

- Currently implementing a persistent MCAS system that allows the programmer to atomically modify a set of shared objects if another previously read set of shared objects is still up-to-date.

### Towards Efficient Nonblocking Persistent Software Transactional Memory

U. of Rochester, NY

*Supervised by Professor Michael L. Scott*

*May. 2018–Apr. 2019*

- Presented QSTM (Queue-based Software Transactional Memory), a novel system that provides non-blocking thread-safe transactions on non-volatile byte-addressable memories.
- Helped with refining designs and debugging.
- Published as a technical report.

### Debugging Persistent Concurrent Programs

U. of Rochester, NY

*Supervised by Dr. Sreepathi Pai, Associate Professor*

*Sep. 2018–Dec. 2018*

- Surveyed debugging tools for concurrent programs using execution synthesis, a combination of static/dynamic analysis and program synthesis.
- Proposed extensions to those debugging tools for programs running on systems with persistent memories and volatile caches.

### **Software Transactional Memory on Dalí**

*Supervised by Professor Michael L. Scott*

U. of Rochester, NY

*Aug. 2017–May. 2018*

- Aimed at building an object-based Transactional Memory (TM) system on Dalí, a periodically persistent hash map.
- Helped re-implement Dalí and verify its correctness.
- Experimented with different implementations of whole-cache flushes in Dalí.

### **Interval-Based Memory Reclamation**

*Supervised by Professor Michael L. Scott*

U. of Rochester, NY

*Jan. 2017–Feb. 2018*

- Led the design of a group of new memory management schemes for non-blocking concurrent data structures, which, with low overhead, bound the number of unreclaimable blocks held by stalling threads.
- Evaluated these schemes against state-of-art approaches and verified both low overhead and bounded space.
- As the lead author, presented the results at PPOPP'18.

### **Inter-Thread/Inter-Process Communication Performance Bottlenecks**

*Supervised by Professor Michael L. Scott*

U. of Rochester, NY

*Sep. 2016–Dec. 2016*

- The goal was to find the bottlenecks of inter-process communication throughput across remote direct memory access (RDMA) links.
- Did a series of experiments to test the influence of factors (context switching, cache footprint, TLB hit rate, etc.) that may be bottlenecks by adding one factor each time to the experiment.
- Learned to use performance counters, including the PAPI library, to get hardware statistics to explain the outcomes of experiments.

### **Multipath Routing Strategy Based on Cooperation and Games**

*Supervised by Professor Jiahai Yang*

Tsinghua U., China

*Aug. 2015–Sep. 2016*

- Used OpenvSwitch, an open-source virtual switch; Floodlight, an Openflow controller; and Mininet, an SDN simulation platform to design experiments to compare several existing traffic engineering algorithms.
- Did all the experiments in a paper independently, including building network topologies, writing Python scripts to program the controller (Floodlight), recording data, and analyzing it with statistical methods.

### **Internet Multipath Routing Between Domains**

*Supervised by Professor Jiahai Yang*

Tsinghua U., China

*Aug. 2015–Sep. 2016*

- Modified code of OpenvSwitch in order to add a cache queue to buffer the packets forwarded in a new traffic engineering algorithm—Flowlet-binned Algorithm Based on Timeslot (FLAT).
- Expanded Openflow protocol experimentally; defined and realized a new action option in flow tables to realize the buffering function mentioned above.

### **A Universal Platform for Routing Strategies Powered by DPI on SDN**

*Supervised by Dr. Fu Chen, Associate Professor.*

BFSU, China

*Dec. 2015–Jun. 2016*

- Implemented nDPI, a deep package inspection (DPI) library, into an SDN controller, enabling routing strategies based on flow patterns and application-level protocols rather than merely the information in package headers.
- Tested simple application-level routing strategies on the system.

**Analysis of the Global Influence of Chinese Culture Based on Big Data** BFSU, China  
*Supervised by Dr. Fu Chen, Associate Professor.* Feb. 2015–Dec. 2015

- Studied detailed features of the Openflow protocol and the design and implementation of some popular SDN emulation tools such as Mininet and OpenvSwitch.
- Helped edit a chapter of a book in progress about SDN.
- Helped with a feasibility study for a database of Confucian scholars and institutions.

**Network Services Modeling of Next Generation Networks** BFSU, China  
*Supervised by Dr. Fu Chen, Associate Professor.* Mar. 2013–Aug. 2013

- Used Nutch to search and grab web data from the Internet, and used Solr to index it for further usage by a searching engine.

## TEACHING ASSISTANCE

---

**Database Systems (CSC2/461)** U. of Rochester, NY  
*Led by Dr. Tamal T. Biswas* Aug. 2017–Dec. 2017, Jan. 2018–Apr. 2018  
*Led by Dr. Eustrat Zhupa* Aug. 2018–Dec. 2018

- Covered database design theories, applications of SQL, NoSQL (MongoDB) and NoSQL in distributed environments (SPARK).

## PUBLICATIONS

---

- “Towards Efficient Nonblocking Persistent Software Transactional Memory” by H. Alan Beadle, Wentao Cai, Haosen Wen, and Michael L. Scott. TR 1006, Computer Science Dept., Univ. of Rochester, Apr. 2019.
- “Interval-Based Memory Reclamation” by H. Wen, J. Izraelevitz, W. Cai, H. A. Beadle, and M. L. Scott. *23rd ACM Symposium on Principles and Practice of Parallel Programming (PPoPP)*, Vienna, Austria, Feb. 2018.
- “Multipath routing research based on traffic measurement under SDN in data center networks” by Y. Yang, J. Yang, H. Wen, and H. Wang. *Journal of Huazhong University of Science and Technology (Natural Science Edition)*, 44(11), Nov. 2016.

## TECHNICAL SKILLS

---

- Proficient in C/C++, SQL, experienced in OCaml, Ruby, MATLAB, Java/JSP, C#, Python, JavaScript.
- Proficient in parallel programming, experienced in programming on persistent main memory.
- Experienced in database design and management.
- Experienced with exploring large code base.

## AWARDS & HONORS

---

- Honorable Mention in Mathematical Contest of Modeling (MCM). *May 2016*  
An international contest for high school students and college undergraduates, with thousands of participants.
- Huawei Scholarship of BFSU. *Dec. 2014*
- Outstanding Student Leader of the Youth League of China. *May 2013 & Nov. 2015*  
An honor for top 5% student leaders in colleges in China.

## EXTRACURRICULAR ACTIVITIES

---

- Member of University of Rochester Badminton Club. *Sep. 2017–Present*
- Member of Chinese Choral Society of Rochester. *Jan. 2017–Present*
- Silver medal of YONEX Eastern Collegiate Team Badminton Championships, Division 2, on behalf of University of Rochester. *Oct. 27–28, 2018*
- Leader and conductor of the Choir of BFSU. *Sep. 2014–Jul. 2015*
- Associate director of the Art Troupe of BFSU. *Sep. 2014–Jul. 2015*