

# TYLER SORENSEN

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Department of Computing, Imperial College London

## EDUCATION

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- PhD in Computer Science** *Fall 2017*  
*Imperial College London*, London, UK  
Adviser: Dr. Alastair F. Donaldson
- MS in Computer Science – GPA 3.9/4.0** *Spring 2014*  
*University of Utah*, Salt Lake City, UT  
Adviser: Prof. Ganesh Gopalakrishnan  
Thesis: Testing and Exposing GPU Weak Memory Models
- BS in Computer Science – GPA 3.9/4.0** *Spring 2014*  
*University of Utah*, Salt Lake City, UT  
Adviser: Prof. Ganesh Gopalakrishnan  
Thesis: Towards Shared Memory Consistency for GPUs
- BS in Applied Mathematics – GPA 3.9/4.0** *Spring 2014*  
*University of Utah*, Salt Lake City, UT

## PEER REVIEWED PUBLICATIONS

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- (under submission) T. Sorensen, H. Evrard, A. F. Donaldson. “Cooperative kernels: safe multitasking for blocking algorithms on GPUs” 2017
- J. Wickerson, M. Batty, T. Sorensen, G. A. Constantinides. “Automatically comparing memory consistency models” *Principles of Programming Languages (POPL)*, 2017
- T. Sorensen, A. F. Donaldson, M. Batty, G. Gopalakrishnan, Z. Rakamaric. “Portable inter-workgroup barrier synchronisation for GPUs” *Obj.-Oriented Programming, Systems, Languages & Applications (OOPLSA)*, 2016  
*Artifact passed evaluation*
- T. Sorensen, A. F. Donaldson. “Exposing errors related to weak memory in GPU applications” *Programming Language Design and Implementation (PLDI)*, 2016
- T. Sorensen, A. F. Donaldson. “The hitchhiker’s guide to cross-platform OpenCL application development” *International Workshop on OpenCL (IWOCCL)*, 2016
- J. Alglave, M. Batty, A. F. Donaldson, G. Gopalakrishnan, J. Ketema, D. Poetzl, T. Sorensen, and J. Wickerson. “GPU concurrency: weak behaviours and programming assumptions” *Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, 2015.  
*Contributions mentioned in LWN: <http://lwn.net/Articles/608550/>*
- (short paper) J. Alglave, L. Maranget, D. Poetzl, T. Sorensen. “I compute, therefore I am (buggy): methodic doubt meets multiprocessors” *Tiny Transactions on Computer Science (Tiny ToCS)*, 2015
- (poster paper) T. Sorensen, J. Alglave, G. Gopalakrishnan, V. Grover. “Towards shared memory consistency for GPUs” *International Conference on Supercomputing (ICS)*, 2013  
*1st place in ICS undergraduate ACM Student Research Competition*

## ACADEMIC SERVICE

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- Tiny ToCS:** Program Committee *Spring 2016*  
**POPL:** Artifact Evaluation Committee *Fall 2015*

## PRACTICAL RESEARCH EXPERIENCE

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**Lower Level Programming:** Experience writing and debugging CUDA, OpenCL, and C/++ programs; emphasis on fine-grained concurrency primitives using C11-like atomics and memory fences, often special cased per GPU architecture (Nvidia, Intel, AMD, ARM).

**Higher Level Programming:** Experience scripting large experimental campaigns (Python, Bash); organising and visualising data (gnuplot); enforcing cross platform portability (Windows, Linux-X86, Linux-ARM).

**Formal Reasoning:** Experience writing formal memory consistency models using relational algebra; used formal tools (Alloy, diy) to check program executions, generate unit tests, differentiate different models;

## INTERNSHIPS AND SUMMER SCHOOLS

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**Microsoft - Speech Decoding, Intern** *Spring 2016*

Mentors: Veljko Miljanic, Hosam Khalil, Madan Musuvathi

- Improved parallel speech decoding, e.g. Cortana backend, from 1.05x speedup to 1.6x speedup (on 4 cores)

**Nvidia - Compiler Group, Intern** *Summer 2013, Summer 2014*

Mentor: Vinod Grover

- Contributed to internal shared memory consistency model

**I2PC Summer School on Multicore Programming with Java** *Summer 2012*

- One week course on concurrency in Java at UIUC by Prof. Daniel Dig

## TEACHING

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**Think Computer Science, Microsoft Research Student Workshop** *Fall 2014*

- Tutored lab sessions for middle school students using Python on Raspberry Pis

**Updating and Expanding Foundational CS Classes, Pedagogical Research** *Fall 2012*

Adviser: Prof. Ganesh Gopalakrishnan

- Wrote course modules for material in foundational CS, e.g. automata theory, logic, including an interactive online app for binary decision diagrams (still functional)
  - <http://formal.cs.utah.edu:8080/pb1> (avg. 54 uses per week as of Dec. 2016)
  - App has been used in courses at University of Utah and Cambridge University
- Presented to Utah state Legislatures at *Research Posters on the Hill 2013*
- TA'ed for undergraduate course using this new material (CS3100 Models of Computation)

**Teaching Assistant, CS1410 Introduction to Object-Oriented Programming** *Fall 2011*

- Managed 3 lab sections per week
- Tutored students on object-oriented programming in Java

## AWARDS AND RECOGNITION

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Staff pick award for Imperial art of research competition *Spring 2016*

Outstanding graduating senior award from University of Utah *Spring 2014*

Top 5 in computing research association (CRA) undergraduate researcher competition *Fall 2013*

1st place ACM undergrad research competition, ICS 2013 *Summer 2013*

1st place team super computing student cluster competition (SC 2012) *Fall 2012*

2nd place at BYU's ACM invitational programming contest *October 2012*

1st Place at BYU's ACM invitational programming contest *April 2012*

Honorable mention in the Microsoft Imagine Cup game design competition *Spring 2011*