

# Tuan Ta

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## Education

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### Cornell University

2017 – Present

Doctor of Philosophy in Computer & Electrical Engineering

Research Interests: Computer Architecture, Parallel Programming & Systems

### University of Mississippi

2012 – 2016

Bachelor of Science in Computer Science

Minor in Mathematics for Engineering

Summa Cum Laude | GPA 4.0 / 4.0

## Publications

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- **Tuan Ta**, Xianwei Zhang, Anthony Gutierrez, and Bradford M. Beckmann. “**Autonomous Data-Race-Free GPU Testing.**” *IEEE International Symposium on Workload Characterization (IISWC)*, to be presented in Nov. 2019.
- David Troendle, **Tuan Ta**, and Byunghyun Jang. “**A Specialized Concurrent Queue for Scheduling Irregular Workloads on GPUs.**” *48<sup>th</sup> International Conference on Parallel Processing (ICPP)*, Aug. 2019.
- Christopher Torng, Shunning Jiang, Khalid Al-Hawaj, Ivan Bukreyev, Berkin Ilbeyi, **Tuan Ta**, Lin Cheng, Julian Puscari, Ian Galton, and Christopher Batten. “**A New Era of Silicon Prototyping in Computer Architecture Research.**” *RISC-V Day Workshop at the 51<sup>st</sup> International Symposium on Microarchitecture*, Oct. 2018.
- **Tuan Ta**, Lin Cheng, and Christopher Batten. “**Simulating Multi-Core RISC-V Systems in gem5.**” *2<sup>nd</sup> Workshop on Computer Architecture Research with RISC-V (CARRV) held in conjunction with ISCA-45*, June 2018.
- Elliott Samuel, Raghu Raj Prasanna Kumar, Natasha Flyer, **Tuan Ta**, and Richard Loft. “**Implementation of a Scalable, Performance Portable Shallow Water Equation Solver Using Radial Basis Function-Generated Finite Difference Methods.**” *International Journal of High Performance Computing Applications (IJHPCA)*, 2018.
- **Tuan Ta**, David Troendle, Xiaoqi Hu, Byunghyun Jang. “**Understanding the Impact of Fine-Grained Data Sharing and Thread Communication on Heterogeneous Workload Development.**” *16<sup>th</sup> IEEE International Symposium on Parallel & Distributed Computing (ISPDC)*, July 2017.
- **Tuan Ta**, David Troendle, and Byunghyun Jang. “**Thread Communication and Synchronization on Massively Parallel GPUs.**” A chapter in *Advances in GPU Research and Practice* book edited by Hamid Sarbazi-Azad, 2016.
- **Tuan Ta**, Kyoshin Choo, Eh Tan, Byunghyun Jang, Eunseo Choi. “**Accelerating DynEarthSol3D on Tightly Coupled CPU-GPU Heterogeneous Processors.**” *Computers & Geosciences Journal*, June 2015.

## Presentation

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- **“Optimizations of Scientific Computation across Languages and Platforms.”** A talk given to scientists at National Center for Atmospheric Research on my internship project.

## Academic Experience

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### Batten Research Group, Cornell University

*Graduate Research Assistant*

Aug, 2017 – Present

- Building an energy-efficient high-performance task-centric architecture composed of many tiny cores for task-parallel applications
- Developed a multi-thread RISC-V port of gem5 simulator

### HEROES Research Group, University of Mississippi

*Research Associate*

Jun, 2016 – Mar, 2017

- Studied different coherence protocols for tightly coupled CPU/GPU systems for emerging heterogeneous workloads
- Took leading efforts in a funded NSF grant proposal that aims at advancing the memory subsystem of tightly coupled CPU/GPU heterogeneous processors
- Characterized multiple CPU-GPU cooperation paradigms in fine-grained data sharing CPU-GPU systems

*Undergraduate Research Assistant*

Dec, 2013 – May, 2016

- Designed concurrent data structures including linked list, queue and d-ary heap for CPU-GPU heterogeneous systems
- Accelerated an unstructured mesh-based simulator, DynEarthSol3D, used to study the long-term deformation of Earth’s lithosphere on GPU using OpenCL

## Industry Experience

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### AMD Research

*Research Engineering Co-op*

Mar, 2017 – Jul, 2017

- Modeled and evaluated AMD’s next-generation GPU’s memory system in gem5 simulator
- Developed a random testing methodology for GPU’s cache coherence protocols

### National Center for Atmospheric Research

*Undergraduate Research Intern*

May, 2015 – Aug, 2015

- Parallelized and accelerated Shallow Water Equations (SWE) using Radial Basis Function Finite Difference (RBF-FD) method on multi-core CPUs and GPUs using different programming models
- Analyzed a trade-off between portability and performance of OpenCL programming model in SWE using RBF-FD in comparison with OpenMP and CUDA on multi-core CPUs and GPUs

## Teaching Experience

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- Lead Graduate Teaching Assistant 2018  
ECE 2400 Computer Systems Programming at Cornell University
- Undergraduate Teaching Assistant at University of Mississippi 2013 – 2016

## Honors & Awards

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***Jacobs Scholar Fellowship*** Cornell, 2017

A one-semester fellowship given to PhD students by School of Electrical and Computer Engineering at Cornell University

***Summer Student of the Tour*** AMD, 2017

An award recommended by managers and mentors at AMD to recognize significant contributions of outstanding student interns and co-ops to the company

***Taylor Medal*** University of Mississippi, 2016

The highest academic honor conferred by the University of Mississippi

***Outstanding Computer Science Student Awards*** University of Mississippi, 2014, 2015 & 2016

Annual awards recommended by faculty members in Department of Computer and Information Science at University of Mississippi

***Computer Science SAP Scholarship*** University of Mississippi, 2015

***Second place in a Student Poster Competition at RMACC conference*** 2015

Won a trip to Supercomputing Conference (SC15) in Austin, TX in Nov 2015

***International Undergraduate Student Scholarship*** University of Mississippi, 2014

A two-year scholarship awarded by Office of International Programs to outstanding international students on account of their academic excellence and achievement at University of Mississippi

***Academic Excellence Scholarship*** University of Mississippi, 2012 – 2016

A four-year full-tuition scholarship awarded by Office of International Programs to a handful of outstanding undergraduate students at University of Mississippi

***John G. Adler Engineering Scholarship*** University of Mississippi, 2012 – 2016

A four-year scholarship awarded by School of Engineering to a handful of undergraduate students at University of Mississippi