Robert S. Utterback

CONTACT INFORMATION

Monmouth College
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EDUCATION

2017 PhD in Computer Science
Washington University in St. Louis
GPA: 3.96
Dissertation Title
Easier Parallel Programming with Provably-Efficient Runtime Schedulers
Advisors
Kunal Agrawal, Angelina Lee

2012 BS in Mathematics and Computer Science
Truman State University
GPA: 4.0

PROFESSIONAL APPOINTMENTS

2017 — present **Assistant Professor**
Department of Mathematics, Statistics, & Computer Science
Monmouth College

TEACHING EXPERIENCE

Spring 2019	*Object-Oriented Programming; Operating Systems*
Fall 2018	*Computer Organization and Design; Data Structures; Applied Machine Learning*
Spring 2018	*Object-Oriented Programming; Analysis of Algorithms*
Fall 2017	*Computer Organization and Design; Data Structures; Programming Languages*
Spring 2017	*Analysis of Algorithms*
Fall 2016	*Parallel Algorithms* (Guest Lecturer)
Fall 2014	*Parallel Algorithms* (Teaching Assistant)
	[Received 6.0/7.0 overall rating from students]
Spring 2013	*Parallel Algorithms* (Teaching Assistant, weekly recitation)
	[Received 6.3/7.0 overall rating from students]

TEACHING DEVELOPMENT

August 2018 New Computer Science Faculty Teaching Workshop
NSF-Funded workshop for teaching-oriented computer science faculty

Fall 2017 — Spring 2018 "Motivating Students" faculty reading group

2013 — 2016	WUSTL Teaching Center pedagogical workshops: Designing Inclusive STEM Materials (2016) Structuring Opportunities for Active Learning During Lectures (2016) Mentoring Undergraduate Research (2016) Teaching in Review Sessions and Office Hours (2013) Designing and Facilitating Group Work (2013)

PROFESSIONAL SERVICE

2018	Poster Review Committee ACM Richard Tapia Celebration of Diversity in Computing
2016	Artifact Evaluation Committee Symposium on Principles and Practices of Parallel Programming 2017 (PPoPP)
2016	(Sub)Reviewer Symposium on Principles and Practices of Parallel Programming 2017 (PPoPP)
2013	(Sub)Reviewer Supercomputing Conference (SC)

RESEARCH INTERESTS

Parallel Computing, Algorithms and Data Structures, Parallel Scheduling, Dynamic Multithreading, Computational Complexity

FULL-LENGTH, PEER-REVIEWED PUBLICATIONS

Robert Utterback, Kunal Agrawal, Jeremy Fineman, I-Ting Angelina Lee. "Efficient Race Detection with Futures". In *Proceedings of the Symposium on Principles and Practices of Parallel Programming (PPoPP)* 2019. Acceptance rate: 19%

Kunal Agrawal, Joseph Devietti, Jeremy Fineman, I-Ting Angelina Lee, Robert Utterback, Changming Xu. "Race Detection and Reachability in Nearly Series-Parallel DAGs". In *Proceedings of the Twenty-Ninth Annual ACM-SIAM Symposium on Discrete Algorithms* 2018. Acceptance rate: 33%

Robert Utterback, Kunal Agrawal, I-Ting Angelina Lee, Milind Kulkarni. "Processor-Oblivious Record and Replay". In the *Proceedings of the Symposium on Principles and Practices of Parallel Programming (PPoPP)* 2017. Acceptance rate: 22%

Robert Utterback, Kunal Agrawal, Jeremy Fineman, I-Ting Angelina Lee. "Provably Good and Practically Efficient Parallel Race Detection for Fork-Join Programs". In the *Proceedings of the Symposium on Parallelism in Algorithms and Architectures (SPAA)* 2016. Acceptance rate: 25%

Kunal Agrawal, Jeremy Fineman, Kefu Lu, Brendan Sheridan, Jim Sukha, Robert Utterback. "Provably Good Scheduling for Parallel Programs that Use Data Structures through Implicit Batching". In the *Proceedings of the Symposium on Parallelism in Algorithms and*

Architectures (SPAA) 2014. Acceptance rate: 25%

OTHER RESEARCH ARTIFACTS

Utterback, Robert and Lee, I-Ting Angelina. Software: FutureRD: Race Detection for Future-Parallel Computations. 2018. Github repository. `https://github.com/wustl-pctg/futurerd.git`.

Utterback, Robert. "Easier Parallel Programming with Provably-Efficient Runtime Schedulers" (2017). Engineering and Applied Science Theses & Dissertations. 303. `https://openscholarship.wustl.edu/eng_etds/303`

Utterback, Robert and Lee, I-Ting Angelina. Software: PORRidge: Processor-Oblivious Record and Replay. 2016. Gitlab repository. `https://gitlab.com/wustl-pctg-pub/porridge`.

Utterback, Robert. Software: CRacer and Batcher Runtime. 2015. Gitlab repository. `https://gitlab.com/wustl-pctg-pub/cracer`

Kunal Agrawal, Jeremy Fineman, Brendan Sheridan, Jim Sukha, Robert Utterback. Poster: "Provably Good Scheduling for Parallel Programs that Use Data Structures through Implicit Batching". In the *Proceedings of the Symposium on Principles and Practices of Parallel Programming (PPoPP)* 2014. Full paper acceptance rate: 15%

GRANTS

November 2018	NVidia GPU Grant NVidia Corporation donated a Titan V GPU (MSRP: 3000 USD) to support research on work-stealing schedulers on GPUs.

TECHNICAL TALKS

2019	"Efficient Race Detection with Futures" Symposium on Principles and Practices of Parallel Programming (PPoPP)
2017	"Processor-Oblivious Record and Replay" Symposium on Principles and Practices of Parallel Programming (PPoPP)
2016	"Provably good and practically efficient parallel race detection" Symposium on Parallelism in Algorithms and Architectures (SPAA)
2016	"Parallel Divide and Conquer Algorithms" Lecture for CSE 341: Parallel Algorithms (WUSTL)
2016	"Luby's Algorithm for Maximal Independent Set" Lecture for CSE 341: Parallel Algorithms (WUSTL)
2015	"Detecting Race Conditions in Parallel" WUSTL Doctoral Student Seminar
2014	"Detecting Race Conditions in Parallel"

WUSTL Doctoral Student Seminar

2013 "Implicitly Batching Parallel Data Structure Operations"
WUSTL Doctoral Student Seminar

RESEARCH EXPERIENCE

2012 — 2017 Research assistant
Washington University in St. Louis
Parallel Computing Technologies Group
St. Louis, MO
Advisors: Kunal Agrawal and Angelina Lee

Projects: Designed and developed several runtime systems to ease parallel programming.
Batcher is a runtime scheduler that allows programmers to write batched data structures but use them as traditional concurrent data structures by implicitly grouping data structure operations and scheduling them efficiently.
CRacer is a runtime system and instrumentation tool to detect determinacy races in Cilk Plus programs. It is asymptotically optimal and efficient in practice.
PORRidge is a record and replay system designed to handle critical sections in fork-join programs. It is processor-oblivious, i.e. recording may use more or less cores than replay, and is nearly asymptotically optimal for both recording and replaying.

2015 Research Intern
Huawei
Santa Clara, CA
Researched techniques for applying the actor programming model
Built a C pre-processor to handle actor model syntax and applied to a distributed computing framework

AWARDS AND HONORS

2017 SIGPLAN PAC Student Travel Grant
2016 SPAA Student Travel Grant
2014 SPAA Student Travel Grant
2012 Outstanding Senior in Computer Science
Truman State University, Department of Math and Computer Science
2012 Departmental Honors
Truman State University, Department of Math and Computer Science
2008 Truman Leadership Scholarship

FORMAL STUDY

2019	Coursera Machine Learning Specialization (Certificate)
	Machine Learning: Clustering and Retrieval (Coursera)
2018	New Computer Science Faculty Teaching Workshop (Participant);
	Machine Learning: Regression (Coursera);
	Machine Learning: Classification (Coursera)
2016	The Data Scientist's Toolbox (Coursera Data Science);
	R Programming (Coursera);
	Getting and Cleaning Data (Coursera);
	Exploratory Data Analysis (Coursera)

MONMOUTH COLLEGE SERVICE

2018-Present	Member of New Faculty Orientation Committee
2018-Present	Member of Campus Technology Futures Group
2017-Present	Assisted in administering department capstone course

GENERAL EXPERIENCE

Programming Languages (in alphabetical order)
Bash, C/C++, Java, LaTeX, Make, Python, R

Software technologies and systems
Compilers (GCC, LLVM, flex, bison), Linux, Cilk Plus runtime

NONACADEMIC WORK

2011	Software Engineering Intern
	Cerner Corporation
	Developed unit testing and continuopus integration framework

PROFESSIONAL MEMBERSHIPS OR AFFILIATIONS

ACM
Member

REFERENCES

Logan Mayfield
Professor of Computer Science
Department of Mathematics, Statistics, and Computer Science
Monmouth College
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Kunal Agrawal
Associate Professor of Computer Science

Department of Computer Science and Engineering
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Ben Moseley
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