Robert S. Utterback

CONTACT INFORMATION

Monmouth College
Dept. of Mathematics, Statistics, and Computer Science
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FORMAL 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 and Angelina Lee

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

FURTHER TRAINING

2019 Machine Learning with TensorFlow on Google Cloud Specialization
A 5-Course specialization by Google on Coursera:
Art and Science of Machine Learning (June 2019);
Feature Engineering (June 2019);
How Google Does Machine Learning (May 2019);
Intro to TensorFlow (May 2019);
Launching into Machine Learning (May 2019);

2019 Machine Learning Specialization
A 4-Course specialization by the University of Washington on Coursera:
Machine Learning: Clustering and Retrieval (January 2019)
Machine Learning: Classification (August 2018));
Machine Learning: Regression (August 2018);
Machine Learning Foundations: A Case Study Approach (July 2018)

2016 The Data Scientist's Toolbox (Coursera course – Johns Hopkins);
R Programming (Coursera course – Johns Hopkins);
Getting and Cleaning Data (Coursera course – Johns Hopkins);
Exploratory Data Analysis (Coursera course – Johns Hopkins)

PROFESSIONAL APPOINTMENTS

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

TEACHING EXPERIENCE

Spring 2020	*Introduction to Programming*;
	Analysis of Algorithms;
	Competitive Programming (new course);
	Senior Capstone;
Fall 2019	*Object-Oriented Data Structures and Algorithms* (new course);
	Programming Languages;
Spring 2019	*Object-Oriented Programming*;
	Operating Systems;
	Senior Capstone;
Fall 2018	*Computer Organization and Design*;
	Data Structures;
	Applied Machine Learning (new course);
Spring 2018	*Object-Oriented Programming*;
	Analysis of Algorithms;
Fall 2017	*Computer Organization and Design*;
	Data Structures;
	Programming Languages;
Spring 2017	*Analysis of Algorithms* (Washington University in St. Louis)
Fall 2016	*Parallel Algorithms* (Guest Lecturer)
Fall 2014	*Parallel Algorithms* (Teaching Assistant)
Summer 2014	WUSTL REU Mentor
	Mentored two undergraduate students in parallel algorithms
Summer 2013	WUSTL REU Mentor
	Mentored two undergraduate students in developing parallel data structures
Spring 2013	*Parallel Algorithms* (Teaching Assistant, weekly recitation)

TEACHING DEVELOPMENT

August 2018	New Computer Science Faculty Teaching Workshop
	NSF-Funded workshop for new computer science faculty
	University of California, San Diego
Fall 2017 – Spring 2018	"Motivating Students" faculty reading group (Monmouth College)
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

2010 – Present	Association of Computing Machinery Member
2019	Brief Announcement Committee, PPoPP[1] 2020 Review and make acceptance decisions for submitted brief announcements (short submissions)
2019	Reviewer, European Symposium on Algorithms (ESA) 2019
2018	Poster Review Committee, Tapia[2] 2018
2016	Artifact Evaluation Committee, PPoPP[1] 2017 Judge and make acceptance decisions for submitted software artifacts
2016	Reviewer, PPoPP[1] 2017
2013	Reviewer, Supercomputing Conference (SC) 2013

FULL-LENGTH, PEER-REVIEWED PUBLICATIONS

Robert Utterback, Kunal Agrawal, I-Ting Angelina Lee, Milind Kulkarni. "Processor-Oblivious Record and Replay". ACM Transactions on Parallel Computing. Volume 6, Issue 4. December 2019. Invited paper.

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%

[1] Symposium on Principles and Practices of Parallel Programming
[2] ACM Richard Tapia Celebration of Diversity in Computing

RESEARCH REPORTS

Hinck, R. S., Utterback, R., & Cooley, S. C. (August, 2019). Jammu and Kashmir Reach Back: Media Analysis of Extremist Activities in Indian and Pakistani News. Prepared for the Pentagon's Strategic Multilayer Assessment Program: USINDOPACOM Jammu & Kashmir.

OTHER RESEARCH ARTIFACTS

Utterback, Robert. Software: Kashmir Article Narrative Categorization. This software applies machine learning algorithms to automatically cluster Indian and Pakistani news articles into thematic groups. Not yet available to the public.

Utterback, Robert. Software: Leader Network Analysis. This software applies machine learning algorithms to search for important entities named in news articles, focusing on finding which entities held important meetings together. Not yet available to the public.

Utterback, Robert and Jouhal, Abhi. Software: Try-lock PORRidge: Adding Record and Replay Support for Try-locks. 2019. Gitlab repository. `https://gitlab.com/wustl-pctg/cilkrecord`.

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 Systems. 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%

AWARDS, HONORS, AND ACCEPTED GRANTS

February 2020 — Border, Trade, and Immigration Grant
- Title: Mexican and Northern Triangle Perspectives on Mass Migration: Identifying and Assessing Strategic Narrative Alignment
- Institutions: Monmouth College, Oklahoma State University
- Amount: $185,000
- Role: Technical Expert

Summer 2019 — Jean Cheng Go Endowment Funds
- Funded research with a student — Abhi Jouhal
- Project: Automatic Categorization of News Articles
- For use in my collaborative project with Dr. Robert Hinck

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

2017 — SIGPLAN PAC Student Travel Grant
- To present at PPoPP in Austin, Texas

2012 – 2017 — WUSTL Graduate Research Assistantship
- Full tuition plus stipend

2016 — SPAA Student Travel Grant
- To present at SPAA in Monterey, California

2014 — SPAA Student Travel Grant
- To attend SPAA in Prague, Czech Republic

2012 — WUSTL Summer Research
- NSF-funded research with Kunal Agrawal prior to graduate school

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
- Merit-based full-ride scholarship plus additional leadership training

GRANT PROPOSALS

September 2019 — Minerva Research Initiative grant proposal (status: under review)
- Title: Understanding the Influence of Power of Regional Strategic Narratives and Multi-Audience Responses in Central Asia and Western Europe
- Institutions: Air University; Oklahoma State University; Monmouth College; NSI, Inc.
- Amount: $400,000, including funding for several undergraduate research assistants
- Role: Key personnel

February 2019 — Data Science Training grant proposal (status: under review)
- Title: HDR DSC: Practical training pathways to advance the transdisciplinary data science workforce
- Institutions: UIUC, Monmouth College, Parkland College
- Amount: $130,000 (subaward), supporting student

and faculty data science projects
Role: Senior Personnel

November 2018 LSAMP (status: not funded)
Title: Southern/Central Illinois Louis Stokes Alliance for Minority Participation (SCI-LSAMP) Pre-alliance Planning
Institutions: Bradley University, Eastern Illinois University Heartland Community College, Illinois Central College Illinois State University, Illinois Wesleyan University Monmouth College, Southern Illinois University, Carbondale UIUC, Western Illinois University
Amount: $120,000
Role: Monmouth College planning leader

TECHNICAL TALKS

September 2019 "Fast Race Detection for Parallel Programs"
Monmouth College Faculty Colloquium

February 2019 "Efficient Race Detection with Futures"
Symposium on Principles and Practices of Parallel Programming
Washington, D.C.

February 2017 "Processor-Oblivious Record and Replay"
Symposium on Principles and Practices of Parallel Programming
Austin, Texas

2016 "Provably good and practically efficient parallel race detection"
Symposium on Parallelism in Algorithms and Architectures
Monterey, California

2016 "Parallel Divide and Conquer Algorithms"
Guest lecture for CSE 341: Parallel Algorithms (WUSTL)

2016 "Luby's Algorithm for Maximal Independent Set"
Guest 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

CONFERENCE ACTIVITY/PARTICIPATION

June 2019 Virtual Residency Introductory/Intermediate Workshop
A workshop aimed at training people to become "research computing facilitators," who deploy and manage cyber-infrastructure and work with researchers to improve their research productivity via computational resources. Virtual attendee.

April 2019 Conference of Undergraduate Research & Scholarship

Monmouth College, Monmouth, Illinois
1 student (Abhi Jouhal) presented research in a poster session (general audience)

April 2019 — Consortium for Computing Sciences in Colleges Conference (Central Plains)
St. Charles Community College, St. Charles, Missouri
1 student (Abhi Jouhal) presented parallel computing research in a poster contest (computer science audience)
5 students participated in a programming contest

February 2019 — Principles and Practice of Parallel Programming 2019
Washington, D.C.
Presented my paper, "Efficient Race Detection with Futures."

August 2018 — New Computer Science Faculty Teaching Workshop
University of California, San Diego, California
This workshop focused on educating new faculty to teach computer science effectively and efficiently.

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.

Spring 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

Summer 2014 — WUSTL REU Mentor
Goal: develop a special batched order-maintenance data structures

	Mentored two undergraduate students
	Part of the NSF-funded REU program at WUSTL
Summer 2013	WUSTL REU Mentor
	Goal: develop batched data structures for use with *Batcher*
	Mentored two undergraduate students
	Part of the NSF-funded REU program at WUSTL

MONMOUTH COLLEGE SERVICE

2019	Proposed new course: Competitive Programming
2019-2020	Member of Computer Science Faculty Search Committee
2019-2020	Member of Electrical Engineering Faculty Search Committee
2019-2020	Co-chair of New Faculty Orientation Committee
2018-2019	Co-developer of new Data Science major and minor
	Developed introductory data science course and applied machine learning course
	Co-developer of major Computer Science curriculum update
2018-Present	Member of New Faculty Orientation Committee
2018-Present	Member of Campus Technology Futures Group
2017-Present	Assisted in administering department capstone course

NONACADEMIC WORK

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

REFERENCES

Logan Mayfield
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Department of Mathematics, Statistics, and Computer Science
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