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

2022	DataCamp Data Engineer with Python Track
	A 19-course specialization on how to build effective data architecture, streamline data processing, and maintain large-scale data systems.
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

2023 — present **Associate Professor**
Department of Mathematics, Statistics, & Computer Science
Monmouth College
2017 — 2023 **Assistant Professor**
Department of Mathematics, Statistics, & Computer Science
Monmouth College

TEACHING EXPERIENCE

Spring 2024 *Introduction to Programming*;
Computer Applications (Software Development) (new version of course);
Analysis of Applications;
Fall 2023 *Introduction to Programming*;
Introduction to Data Science (new course);
1st Year Inquiry & Identity (new version of course);
Numerical Analysis (new prep);
Senior Project Research/Implementation;
Spring 2023 *Object-Oriented Data Structures and Algorithms*;
Operating Systems;
Senior Project Research/Implementation;
Fall 2022 *Introduction to Systems Programming*;
Discrete Mathematics (new prep);
Applied Machine Learning;
Spring 2022 *Introduction to Programming*;
Computer Communications (new prep);
Research in Computer Science;
Fall 2021 *Introduction to Programming* (new version of course);
Introduction to Systems Programming (new course);
Programming Languages;
Senior Project Research;
Research in Computing;
Spring 2021 *Object-Oriented Data Structures and Algorithms*;
Database Theory and Design (new prep);
Data Science Applications (new course);
Senior Project Research/Implementation (data science);
Fall 2020 *Object-Oriented Data Structures and Algorithms*;
Applied Machine Learning;
Introduction to the Liberal Arts (new prep);
Spring 2020 *Introduction to Programming* (new prep);
Analysis of Algorithms;
Competitive Programming (new course);
Senior Project Implementation (computer science);
Fall 2019 *Object-Oriented Data Structures and Algorithms* (new course);
Programming Languages;

Spring 2019	*Object-Oriented Programming*; *Operating Systems* (new prep); *Senior Project Implementation* (computer science);
Fall 2018	*Computer Organization and Design*; *Data Structures*; *Applied Machine Learning* (new course);
Spring 2018	*Object-Oriented Programming* (new prep); *Analysis of Algorithms* (new prep);
Fall 2017	*Computer Organization and Design* (new prep); *Data Structures* (new prep); *Programming Languages* (new prep);
Spring 2017	*Analysis of Algorithms* (new course)(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

2017 – 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

2022	Technical Editor for "Python QuickStart Guide"
	    By Robert Oliver
	    Published by Clyde Bank Media in May 2023

2021	ACM SIGCSE[3] 2022 Program Committee member "Computing Education Research" track
2021	Reviewer, SPAA[4] 2021
2010 – Present	Member, Association of Computing Machinery (ACM)
2020 – 2021	Member, IEEE Computer Society
2020	ACM SIGCSE[3] 2021 Program Committee member "Experience Reports and Tools" track

2020	Reviewer, ACM Transactions on Algorithms
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

Hinck, R. S., Utterback, R., Kitsch, S. R., & Wenzel, S. "Migration Narratives in Northern Triangle, Mexican, and US Media from 1999-2019". International Migration. December 2022.

Hinck, R. S., Kitsch, S. R., Utterback, R., & Wenzel, S. "Transforming Media Narratives on Migration: Narrative Divergence within Northern Triangle, Mexican, and US News Reporting on Migration from 1999-2019". Paper presented (by R. Hinck) at the *National Communication Association Annual Conference*. November 2021.

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 *Proceed-*

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[1]Symposium on Principles and Practices of Parallel Programming
[2]ACM Richard Tapia Celebration of Diversity in Computing
[3]Special interest group in computer science education
[4]Symposium on Parallelism in Algorithms and Architectures

ings 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%

RESEARCH REPORTS

The Media Ecology and Strategic Analysis (MESA) Group (January 2021). Mexican and Northern Triangle Perspectives on Migration: Identifying and Assessing Strategic Narrative Alignment. Prepared for the U.S. Department of Homeland Security.

Cooley, S.C., Hinck, R., & Utterback, R. (2019). Jammu and Kashmir Reach Back: Media Analysis of Extremist Activities in Indian and Pakistani News. A Media Ecology & Strategic Analysis (MESA) Group Report. NSI. September. `https://nsiteam.com/jammu-and-kashmir-reach-back-media-analysis-of-extremist-activities-in-indian-and-pakistani-news/`

ARTICLES

Hinck, R., Utterback, R., & Cooley, S. (2020). Russian media may be joining China and Iran in turning on Trump. The Conversation. `https://theconversation.com/russian-media-may-be-joining-china-and-iran-in-turning-on-trump-147807`

OTHER RESEARCH ARTIFACTS

Utterback, Robert and McKirdy, Ryan (undergraduate). Borders, Trade, and Immigration (BTI) Insitute Text Analysis Dashboard. This web application was created to give the BTI Institute a way to dynamic explore and extract insights from text data. Not available to the public; screenshots provided on request.

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; available on request.

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; available on request.

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

Abhi Jouhal (undergraduate), supervised by Robert Utterback. Poster: "Improving Debugging of Parallel Code with Try-locks". Presented at the CCSC Central Plains 2019 conference, student poster session, to a technical audience.

Abhi Jouhal (undergraduate), supervised by Robert Utterback. Poster: "Improving Debugging of Parallel Code with Try-locks". Presented at the 2019 MJUR conference, student poster session. Despite the identical title, this was a different poster that was presented to a **non**-technical audience.

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

Summer 2021	Kieft Faculty Research Fellow
	Eight week fellowship for faculty in the STEM disciplines
	Funded two undergraduates to continue work on a text analytics dashboard
July 2020	Kieft Faculty Research Fellow
	Four week fellowship for faculty in the STEM disciplines
	to support undergraduate research efforts
	Funded preliminary work on a data pipeline for text analytics
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

December 2022	S-STEM (status: not funded)
	Title: NSF Scholarships in Science, Technology, Engineering and Mathematics
November 2022	LSAMP (status: submitted)
	Title: Louis Stokes New STEM Pathways Implementation-Only Alliance:
	Southern and Central Illinois LSAMP
	Institutions: UIUC, Monmouth College, many others
	Role: Research Mentor
September 2019	Minerva Research Initiative (status: program cancelled due to budget cuts)
	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;
	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: not funded)
	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

TECHNICAL TALKS

October 2022   "Text Exploration Dashboard"
                  A Web App for Applying Modern Language Models to Text Datasets
                  Monmouth College Faculty Colloquium
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

January 2023   Abacus.AI StateoftheArt()
                  Virtual Conference on Generative AI, LLMs and ML in Production
May 2022   Abacus.AI Hands-on NLP Workshop

	Virtual Workshop on Natural Language Processing
March 2021	ACM Technical Symposium on Computer Science Education
	Virtual Conference
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

2019 – Present	Researcher
	The Media Ecology and Strategic Analysis (MESA) Group
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

Fall 2022	Meet Monmouth Engineering and CS (admissions event for prospective students)
Spring 2022	Meet Monmouth Engineering and CS (admissions event for prospective students)
Fall 2021	Virtual Masterclass (admissions event for prospective students)
Summer 2021	Installed operating systems and software on new CS lab machines
Spring 2021	Virtual Masterclass (admissions event for counselors)
Spring 2021	Wallace Founders scholarship interviewer
2021–Present	Assisted in adminstering data science capstone course
2020–2021	Member of SASC
Summer 2020	Virtual Masterclass (admissions event for prospective students)
	Title: How to Train Your Computer: Lifting the Veil on
	Modern Artificial Intelligence
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
2018–2020	Member of New Faculty Orientation Committee
2019	Proposed new course: Competitive Programming
2018–2019	Co-developer of new Data Science major and minor
	Developed introductory data science course
	Developed applied machine learning course
2018–2019	Co-developer of major Computer Science curriculum update
2018–2019	Member of Campus Technology Futures Group
2017–Present	Assisted in administering computer science capstone course

NONACADEMIC WORK

| 2019–Present | Freelance Software and Data Science Consulting |

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

REFERENCES

Logan Mayfield
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Ben Moseley
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Jeremy Fineman
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