Srivatsan Ravi

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Dept. of Computer Science, University of Southern California

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Education

Ph.D in Computer Science (2015), Technische Universität Berlin, Germany

Advisors: Anja Feldmann and Petr Kuznetsov
Thesis: On the Cost of Concurrency in Transactional Memory

Masters in Computer Science (2010), Cornell University, U.S.A

Bachelors in Computer Science (2007), Anna University, India

High School (2003), D.A.V Boys, Central Board of Secondary Education, Gopalapuram, India

Research Interests

Algorithms and lower bounds for distributed systems

Distributed programming models and fault-tolerance

Modelling and application of distributed techniques in computational sciences

Book chapters and Journals

"**Lower bounds for transactional memory**"
Srivatsan Ravi
Bulletin of the European Association for Theoretical Computer Science (EATCS), Vol. 121, 2017

"**Inherent limitations of hybrid transactional memory**"
Dan Alistarh, Justin Kopinsky, Petr Kuznetsov, Srivatsan Ravi and Nir Shavit
Distributed Computing (DC) Journal, Springer, 2017
Full version of conference paper from International Symposium on Distributed Computing 2015

"**Grasping the gap between blocking and non-blocking transactional memories**"
Petr Kuznetsov and Srivatsan Ravi
Journal of Parallel and Distributed Computing (JPDC), Elsevier, 2017
Full version of conference paper from International Symposium on Distributed Computing 2015

"**Safety and deferred update in transactional memory**"
Hagit Attiya, Sandeep Hans, Petr Kuznetsov, and Srivatsan Ravi
Transactional Memory. Foundations, Algorithms, Tools, and Applications, Volume 8913 of Lecture Notes in Computer Science, Springer International Publishing, 2015

Conference Publications

"**Generalized Paxos made Byzantine (and Less Complex)**"
Miguel Pires, Srivatsan Ravi, Rodrigo Rodrigues
19th International Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS 2017)

"**Cost of Concurrency in hybrid transactional memory**"
Trevor Brown and Srivatsan Ravi
Distributed Computing - 31th International Symposium (DISC 2017)
Short version also appeared in 12th ACM SIGPLAN Workshop on Transactional Computing

"**Concurrency and privacy with payment-channel networks**"
Pedro Moreno-Sanchez, Giulio Malavolta, Aniket Kate, Matteo Maffei, Srivatsan Ravi
ACM Conference on Computer and Communications Security (CCS 2017)
Short version also presented in Scaling Bitcoin 2017: Stanford Workshop

"**A concurrency-optimal binary search tree**"
Vitaly Aksenov, Vincent Gramoli, Petr Kuznetsov, Anna Malova and Srivatsan Ravi
23rd Intl. European Conference on Parallel and Distributed Computing (EURO-PAR 2017)

"**In the search for optimal concurrency**"
Vincent Gramoli, Petr Kuznetsov, and Srivatsan Ravi
Structural Information and Communication Complexity - 23rd International Colloquium (SIROCCO 2016)

"**Programming scalable cloud services with Atomic Events and Ownership Network (AEON)**"
Bo Sang, Gustavo Petri, Masoud Ardekani, Srivatsan Ravi, and Patrick Eugster
17th International Middleware Conference (2016)

"**Grasping the gap between blocking and non-blocking transactional memories**"
Petr Kuznetsov and Srivatsan Ravi
Distributed Computing - 29th International Symposium (DISC 2015)

"**Inherent limitations of hybrid transactional memory**"
Dan Alistarh, Justin Kopinsky, Petr Kuznetsov, Srivatsan Ravi, and Nir Shavit
Distributed Computing - 29th International Symposium (DISC 2015)
Short version also appeared in 6th Workshop on the Theory of Transactional Memory

"**A concurrency-optimal list-based set (Short paper)**"
Vincent Gramoli, Petr Kuznetsov, Srivatsan Ravi and Di Shang
Distributed Computing - 29th International Symposium (DISC 2015)

"**Progressive transactional memory in time and space**"
Petr Kuznetsov and Srivatsan Ravi
Parallel Computing Technologies - 13th International Conference (PaCT 2015)

"**On partial wait-freedom in transactional memory**"
Petr Kuznetsov and Srivatsan Ravi
International Conference on Distributed Computing and Networking (ICDCN 2015)

"**Safety of deferred update in transactional memory**"
Hagit Attiya, Sandeep Hans, Petr Kuznetsov, and Srivatsan Ravi
IEEE 33rd International Conference on Distributed Computing Systems (ICDCS 2013)

"**From sequential to concurrent: correctness and relative efficiency (short paper)**"
Vincent Gramoli, Petr Kuznetsov, and Srivatsan Ravi
Principles of Distributed Computing (PODC 2012)

"**On the cost of concurrency in transactional memory.**"
Petr Kuznetsov and Srivatsan Ravi
International Conference on Principles of Distributed Systems (OPODIS 2011)

"**Independent navigation and functioning of intelligent agents by social interaction**"
K. Sakthivel, R. Venkatraghavan, S. Shivashankar, R. Srivatsan, and T. Srinivasan
International Conference on Computational Inteligence for Modelling Control and Automation and International Conference on Intelligent Agents Web Technologies and International Commerce (CIMCA 2006)

Workshop papers

"**Programmable Elasticity for Actor-based Cloud Applications**"
Bo Sang, Srivatsan Ravi, Gustavo Petri, Masoud Ardekani, Najaf Zadeh Mahsa, Patrick Eugster
9th Workshop on Programming Languages and Operating Systems (PLOS 2017)

"**Cost of concurrency in hybrid transactional memory**"
Trevor Brown and Srivatsan Ravi
12th ACM SIGPLAN Workshop on Transactional Computing (Transact 2017)

"**The misbelief in delay scheduling**"
Derek Schatzlein, Srivatsan Ravi, Youngtae Noh, Masoud Ardekani, and Patrick Eugster
4th Workshop on Distributed Cloud Computing (DCC 2016)

"**Forget about performance, think about concurrency**"
Vincent Gramoli, Petr Kuznetsov, and Srivatsan Ravi
6th Workshop on the Theory of Transactional Memory (WTTM 2014)

"**Inherent limitations of hybrid transactional memory**"
Dan Alistarh, Justin Kopinsky, Petr Kuznetsov, Srivatsan Ravi, and Nir Shavit
6th Workshop on the Theory of Transactional Memory (WTTM 2014)

"**Sharing a sequential data structure: correctness definition and concurrency analysis**"
Vincent Gramoli, Petr Kuznetsov, and Srivatsan Ravi
4th Workshop on the Theory of Transactional Memory (WTTM 2012)

"**What is safe in transactional memory**"
Hagit Attiya, Sandeep Hans, Petr Kuznetsov, and Srivatsan Ravi
4th Workshop on the Theory of Transactional Memory (WTTM 2012)

Articles and Technical reports

"**Concurrency and privacy with payment-channel networks**"
Pedro Moreno-Sanchez, Giulio Malavolta, Aniket Kate, Matteo Maffei, Srivatsan Ravi
Cryptology ePrint Archive: Report 2017/820
Full version of conference paper in ACM Conference on Computer and Communications Security 2017

"**A concurrency-optimal binary search tree**"
Vitaly Aksenov, Vincent Gramoli, Petr Kuznetsov, Anna Malova, and Srivatsan Ravi
ArXiv Computing Research Repository (CoRR), abs/1702.04441, 2017
Full version of paper in European Conference on Parallel and Distributed Computing 2017

"**On the Cost of Concurrency in Transactional Memory**"
Ph.D thesis, Technische Universität Berlin

Committee: Hagit Attiya (The Technion), Anja Feldmann (Technische Universität Berlin), Rachid Guerraoui (EPFL), Petr Kuznetsov (Télécom ParisTech), Uwe Nestmann (Technische Universität Berlin), Michel Raynal (INRIA, Rennes)
ArXiv Computing Research Repository (CoRR), abs/1407.6876, 2015

"**A concurrency-optimal list-based set**"
Vincent Gramoli, Petr Kuznetsov, Srivatsan Ravi, and Di Shang
ArXiv Computing Research Repository (CoRR), abs/1502.01633, 2015
Full version of paper in International Symposium on Distributed Computing 2015

"**Why transactional memory should not be obstruction-free**"
Petr Kuznetsov and Srivatsan Ravi
ArXiv Computing Research Repository (CoRR), abs/1502.02725, 2015

"**Optimism for boosting concurrency**"
Vincent Gramoli, Petr Kuznetsov, Srivatsan Ravi
ArXiv Computing Research Repository (CoRR), abs/1203.4751, 2012
Full version of paper in Principles of Distributed Computing 2012

"**WTTM 2011: the third workshop on the theory of transactional memory**"
Petr Kuznetsov and Srivatsan Ravi
ACM Special Interest Group on Algorithms and Computation Theory (SIGACT) News, Vol. 43, 2012

"**Transactional memory, linking theory and practice**"
Srivatsan Ravi, Vincent Gramoli, and Victor Luchangco
ACM Special Interest Group on Algorithms and Computation Theory (SIGACT) News, Vol. 41, 2010

Awards and Grants

Principal Investigator; Future of Autonomous Decision Making in Safety-Critical Cyber Environments

Air Force Office of Scientific Research: Science and Technology Study

March 1, 2018 to September 28, 2018

Principal Investigator; Scalable and Secure Software-defined Controllers

Northrop Grumman Research Consortium

October 1, 2017 to September 30, 2018

Co-Principal Investigator; CSR: Small: Elastic and Robust Cloud Programming

National Science Foundation (NSF) Award number 1618923

October 1, 2016 to September 30, 2019

Principal Investigators: Xiangyu Zhang and Patrick Eugster (Purdue University)

Selected conference talks and Invited presentations

"*Cost of Concurrency in Hybrid Transactional Memory*"
Workshop on Transactional Computing 2017, Austin, Texas

"*Towards Scalable and Secure Software-defined Network Controllers*"
Northrop Grumman University Research Symposium, Baltimore, April 2018

"*Synchronization using Transactions: Lower bounds, Algorithms and Applications*"
Information Sciences Institute, University of Southern California (September 2016)
Dept. of Computer Science, University of Southern California (April 2018)

"*Towards Safe In-memory Transactions*"
CERIAS Seminar, Purdue University (August 2016)
Video link: https://www.youtube.com/watch?v=NiwkUPL7urw

"*Grasping the Complexity Gap between Blocking and Non-blocking Transactional Memories*"
International Symposium of Distributed Computing (DISC) 2015, Tokyo, Japan

"*Inherent Limitations of Hybrid Transactional Memory*"
International Symposium of Distributed Computing (DISC), 2015, Tokyo, Japan
Hewlett Packard Labs, Palo Alto (July 2016)

"*Synchronization using Transactional Memory*"
Instituto Superior Technico (IST) Lisbon (July 2015)
NEC Research Lab Heidelberg (June 2015)

"*Progressive Transactional memory in Time and Space*"
International Conference on Parallel Computing Technologies (PaCT) 2015, Petrozavodsk, Russia

"*On Partial Wait-freedom in Transactional memory*"
International Conference on Distributed Computing and Networking (ICDCN) 2015, Goa, India

"*Safety in Distributed Computing*"
Mathematical methods in Distributed computing, Volkswagen Stiftung International Workshop, University of Bremen, Germany, August 2013

"*Safety of Deferred-update semantics in Transactional Memory*"
International Conference on Distributed Computing Systems (ICDCS) 2013, Philadelphia, U.S.A

"*Optimistic Transactions vs. Pessimistic Locks*"
Scalable Synchronization group, Oracle Labs, Burlington (July 2013).

"*From Sequential to Concurrent: Correctness and Relative Efficiency*"
Principles of Distributed Computing (PODC), 2012, Madeira, Portugal
Technion Systems Lunch (Spring 2012), The Technion, Haifa.

"*On the Cost of Concurrency in Transactional Memory*"
International Conference on Principles of Distributed Systems (OPODIS), 2011, Toulouse, France
TRANSFORM Winter School, March 2011, INRIA Rennes, France.

"*Network Topology, Routing and Security Model of Freenet*"
Free and Open Source Software (FOSS.IN) Conference 2008, Indian Institute of Science.

Achievements and Distinctions

University of Southern California, Information Sciences Institute Publication Award 2017

Marie Curie Actions Ph.D Fellowship 2010-2013

Google Summer of Code 2007, Freenet Project

Top-20 in *IBM-Inter Collegiate Programming Contest (ICPC)*, 2006 for the ACM India Regionals and Online Qualifiers

Community services

Journal reviews

IEEE Journal on Special Areas in Communications (JSAC): Special Issue on Scalability Issues and Solutions in Software-Defined Networks

IEEE Transactions on Network and Service Management (TNSM)

Elsevier Computer Networks Journal (COMNET)

Distributed Computing (DC), Springer

Euro-TM Lecture notes in Computer science, Springer 2015

Conference reviews

Subreviewer: International Colloquium on Structural Information and Communication Complexity (SIROCCO) 2016

Subreviewer: International Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS) 2017

One of the organizers of the Workshop on the Theory of Transactional Memory (WTTM'11) held in conjunction with DISC'11 in Rome.

One of the student editors of the report on the Dagstuhl Seminar on *Applications of Combinatorial Topology to Computer Science*, March 2012.

Research Schools and Seminar participation

Northrop Grumman University Research Symposium, Baltimore, April 2018

Mathematical methods in Distributed Computing, Volkswagen Stiftung International Workshop, University of Bremen, August 2013

Hot topics in Distributed Computing (HPDC), La Plagne, March 2012

Ph.D Summer School, Microsoft Research (MSR) Cambridge, July 2012

Dagstuhl Seminar on *Abstractions for scalable multi-core computing*, April 2012

Dagstuhl Seminar on *Applications of Combinatorial Topology to Computer Science*, March 2012