Roberto Palmieri

Contact Information

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Bradley Department of Electrical and
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Research Interests

Distributed Computing, Dependability, Concurrency, Transactional Systems, Performance Modeling and Evaluation. Transactional Protocols, Fault-Tolerant Protocols, Transactional Memory, Database Systems, Distributed Storage.

Education

PhD in Computer Engineering **March 2012**
Department of Computer, Control, and Management Engineering "Antonio Ruberti" (DIAG)
Sapienza University of Rome, Italy
Title: "Speculative Protocols for Actively Replicated Transactional Systems"
Advisor: Prof. Francesco Quaglia, Sapienza University of Rome, Italy
External Referees: Prof. Jennifer Lundelius Welch, Texas A&M University, USA; and Prof. Rachid Guerraoui, École Polytechnique Fédérale De Lausanne, Switzerland

Master Degree in Computer Engineering **September 2008**
Department of Computer, Control, and Management Engineering "Antonio Ruberti" (DIAG)
Sapienza University of Rome, Italy
Title: "Modeling and Evaluation of Relational DBMS based on Lock Concurrency Control and Non Uniform Data Access Pattern"
Advisor: Prof. Bruno Ciciani
Final Rank: 110/110 Cum Laude

Current Position

Post-doctoral Research Associate **January 2013 – present**
Systems Software Research Group
Bradley Department of Electrical and Computer Engineering
Blacksburg, VA 24061, USA
Supervisor: Prof. Binoy Ravindran

Past Positions

Post-doctoral Researcher **January 2012 – December 2012**
Department of Computer, Control, and Management Engineering "Antonio Ruberti" (DIAG)
Sapienza University of Rome, Italy

Lecturer **September 2010 – December 2012**
Faculty of Computer Engineering
Sapienza University of Rome, Italy

Publications

Book Chapters

1. Joao Barreto, Pierangelo Di Sanzo, Roberto Palmieri and Paolo Romano
   Cloud-TM: an elastic, self-tuning transactional store for the cloud
   Book title: Data Intensive Storage Services for Cloud Environments
   IGI Global

Journal Articles

1. Paolo Romano, Roberto Palmieri, Francesco Quaglia, Nuno Carvalho and Luis Rodrigues
On Speculative Replication of Transactional Systems
Journal of Computer and System Sciences (JCSS)
Accepted July 2013, to appear

2. Pierangelo Di Sanzo, Bruno Ciciani, Francesco Quaglia, Roberto Palmieri and P. Romano
On the Analytical Modeling of Concurrency Control Algorithms for Software Transactional Memories: the Case of Commit-Time-Locking
Performance Evaluation Journal, Volume 69, Issue 5, May 2012, Pages 187-205.

Conference Articles[1]

1. Sachin Hirve, Roberto Palmieri, Binoy Ravindran
"HiperTM: High Performance, Fault-Tolerant Transactional Memory"
15th International Conference on Distributed Computing and Networking (ICDCN), LNCS, Springer, January 4-7, 2014, Coimbatore, India.

2. Alexandru Turcu, Roberto Palmieri, Binoy Ravindran
"Automated Data Partitioning for Independent Distributed Transactions"
ACM/IFIP/USENIX 14th International Middleware Conference (Middleware), Proceedings of the Posters and Demo Track, ACM, December 9-13, 2013, Beijing, China.

3. Sachin Hirve, Aaron Lindsay, Binoy Ravindran and Roberto Palmieri
"On Transactional Memory Concurrency Control in Distributed Real-Time Programs"
IEEE Cluster 2013, September 23-27, 2013, Indianapolis, IN, USA. Number of submissions: 147, Acceptance rate: 31%.

4. Alexandru Turcu, Binoy Ravindran, Roberto Palmieri
"Hyflow2: A High Performance Distributed Transactional Memory Framework in Scala"
2013 International Conference on Principles and Practices of Programming on the Java Platform: Virtual Machines, Languages, and Tools (PPPJ), pages 79-88, ACM, September 11-13, 2013, Stuttgart, Germany. Number of submissions: 47, Acceptance rate: 25.53%.

5. Sebastiano Peluso, Roberto Palmieri, Francesco Quaglia, Binoy Ravindran
"On the Viability of Speculative Transactional Replication in Database Systems: a Case Study with PostgreSQL"
12th IEEE International Symposium on Network Computing and Applications (NCA), IEEE, August 22-24, 2013, Cambridge, MA USA. Number of submissions: 77, Acceptance rate: 25%.

6. Sudhanshu Mishra, Alexandru Turcu, Roberto Palmieri, Binoy Ravindran
"HyflowCPP: A Distributed Transactional Memory Framework for C++"
12th IEEE International Symposium on Network Computing and Applications (NCA), IEEE, August 22-24, 2013, Cambridge, MA USA. Number of submissions: 77, Acceptance rate: 25%.

7. Alexandru Turcu, Roberto Palmieri, Binoy Ravindran
"Checkpointing and Closed Nesting in DTM"
Poster at 6th International Systems and Storage Conference (SYSTOR 2013), June 30-July 2, 2013, Haifa, Israel. Poster presented by Antonio Barbalace.

8. Junwhan Kim, Roberto Palmieri, Binoy Ravindran
"Enhancing Concurrency in Distributed Transactional Memory through Commutativity"
19th International European Conference on Parallel and Distributed Computing (Euro-Par 2013), pages 150-161, LNCS 8097, Springer, August 26-30, 2013, Aachen, Germany. Number of submissions: 261, Acceptance rate: 26.8%.

9. Mohamed Mohamedin, Binoy Ravindran, Roberto Palmieri
"ByteSTM: Virtual Machine-level Java Software Transactional Memory"

[1] Author who presented the paper is underlined. Number of submissions and acceptance rate are provided wherever available.

15th International Conference on Coordination Models and Languages (COORDINATION 2013), pages 166-180, LNCS 7890, Springer, June 3-5, 2013, Firenze, Italy.

10. Junwhan Kim, Roberto Palmieri, Binoy Ravindran
"Scheduling Open-Nested Transactions in Distributed Transactional Memory"
15th International Conference on Coordination Models and Languages (COORDINATION 2013), pages 105-120, LNCS 7890, Springer, June 3-5, 2013, Firenze, Italy.
11. Roberto Palmieri, Francesco Quaglia and Paolo Romano
"ASAP: an Aggressive SpeculAtive Protocol for Actively Replicated Transactional Systems"
11th IEEE International Symposium on Network Computing and Applications (NCA), pages 203-211, IEEE, August 23-25, 2012, Cambridge, MA USA. Number of submissions: 80, Acceptance rate: 28%.
12. Roberto Palmieri, Paolo Romano, Francesco Quaglia
"OSARE: Opportunistic Speculation in Actively REplicated Transactional Systems"
30th IEEE Symposium on Reliable Distributed Systems (SRDS), pages 59-64, IEEE, October 4-7, 2011, Madrid, Spain. Number of submissions: 88, Acceptance rate: 34%.
13. Pierangelo Di Sanzo, Bruno Ciciani, Francesco Quaglia, Roberto Palmieri and Paolo Romano
"Analytical Modeling of Commit-Time-Locking Algorithms for Software Transactional Memories"
35th International Computer Measurement Group Conference (CMG), Computer Measurement Group, December 6-10, 2010, Orlando, FL USA.
14. Paolo Romano, Roberto Palmieri, Francesco Quaglia, Nuno Carvalho and Luis Rodrigues
"An Optimal Speculative Transactional Replication Protocol"
8th IEEE International Symposium on Parallel and Distributed Processing with Applications (ISPA), pages 449-457, IEEE, September 6-9, 2010, Taipei, Taiwan.
15. Roberto Palmieri, Paolo Romano, Francesco Quaglia
"AGGRO: Boosting STM Replication via Aggressively Optimistic Transaction Processing"
9th IEEE International Symposium on Network Computing and Applications (NCA), pages 20-27, IEEE, July 15-17, 2010, Cambridge, MA USA. Number of submissions: 72, Acceptance rate: 27%.
16. Paolo Romano, Roberto Palmieri, Francesco Quaglia, Nuno Carvalho, Luis Rodrigues
"Brief announcement: on speculative replication of transactional systems"
22nd ACM Symposium on Parallelism in Algorithms and Architectures (SPAA), pages 69-71, ACM, June 13-15, 2010, Thira, Santorini, Greece. Number of submissions: 110, Acceptance rate: 31%.
17. Pierangelo Di Sanzo, Roberto Palmieri, Bruno Ciciani, Francesco Quaglia and Paolo Romano
"Analytical Modeling of Lock-based Concurrency Control with Arbitrary Transaction Data Access Patterns"
First Joint International Conference on Performance Engineering (WOSP/SIPEW), pages 69-78, ACM, January 28-30, San Jose, CA USA. Number of submissions: 67, Acceptance rate: 24%.

Workshop Articles[2]

1. Peng Lu, Antonio Barbalace, Roberto Palmieri, and Binoy Ravindran
"Adaptive Live Migration to Improve Load Balancing in Virtual Machine Environment"
First international FedICI'2013 workshop: Federative and interoperable cloud infrastructures (FedICI 2013), 19th International European Conference on Parallel and Distributed Computing (Euro-Par 2013), August 26, 2013, Aachen, Germany.
2. Bruno Ciciani, Diego Didona, Pierangelo Di Sanzo, Roberto Palmieri, Sebastiano Peluso, Francesco Quaglia and Paolo Romano

[2]Author who presented the paper is underlined.

"Automated Workload Characterization in Cloud-based Transactional Data Grids"
17th IEEE Workshop on Dependable Parallel, Distributed and Network-Centric Systems (DPDNS12), 26th IEEE International Parallel & Distributed Processing Symposium (IPDPS 2013), pages 1525-1533, IPDPS Workshops, IEEE, May 21-25, 2012, Shanghai, China.

3. Roberto Palmieri, Pierangelo Di Sanzo, Francesco Quaglia, Paolo Romano, S. Peluso and D. Didona
"Integrated Monitoring of Infrastructures and Applications in Cloud Environments"
Workshop On Cloud Computing: Projects And Initiatives (CCPI), 17th International European Conference on Parallel and Distributed Computing (Euro-Par 2011), pages 45-53, Springer, August 30, 2011, Bordeaux, France.
4. Roberto Palmieri, Francesco Quaglia, Paolo Romano and Nuno Carvalho
"Evaluating database-oriented replication schemes in Software Transactional Memory systems"
15th IEEE Workshop on Dependable Parallel, Distributed and Network-Centric Systems (DPDNS10), 26th IEEE International Parallel & Distributed Processing Symposium (IPDPS 2010), pages 1-8, IPDPS Workshops, IEEE, April 19-23, 2010, Atlanta, GA USA.

Invited Talks

1. "TAE-JS: automated enhancement of JavaScript programs by leveraging the Java annotations infrastructure"
2013 International Conference on Principles and Practices of Programming on the Java Platform: Virtual Machines, Languages, and Tools (PPPJ), Authors: Myoungkyu Song, Eli Tilevich, pages 13-24, ACM, September 11-13, 2013, Stuttgart, Germany. Guest presentation.
2. "On Closed Nesting and Checkpointing in Replicated Distributed Transactional Memory"
27th IEEE International Parallel & Distributed Processing Symposium (IPDPS 2013), Authors: Aditya Dhoke, Binoy Ravindran, Bo Zhang, pages 41-52, IEEE, May 20-24, 2013, Boston, MA USA. Guest presentation.
3. "Speculative transactional replication protocols: Overview of AGGRO, STR, and OSARE"
ARISTOS Workshop, September 5-6, 2012, Lisbon, Portugal.
4. "OSARE: Opportunistic Speculation in Actively REplicated Transactional Systems"
2nd Euro-TM Plenary Meeting Workshop on Transactional Memory (WTM), 7th European Conference on Computer Systems (EuroSys), April 10, 2012, Bern, Switzerland.
5. "Boosting STM Replication via Speculation"
1st Euro-TM Workshop on Distributed Transactional Memory (WDTM), February 22, 2012, Lisbon, Portugal.
6. "Performance Modelling and Replication of Software Transactional Memories"
1st Plenary Meeting of Euro-TM, Transactional Memories: Foundations, Algorithms, Tools, and Applicationsin, May 19-20, 2011, Paris, France.

Technical Committees

1. IEEE International Symposium on Network Computing and Applications (IEEE NCA 2014)
2. IEEE International Conference on Services Computing (IEEE SCC 2013)
3. IEEE International Conference and Workshops on Cloud Computing Technology and Science (IEEE CloudCom 2013)
4. International Conference on Dependability (DEPEND 2013)
5. IEEE Conference on Open Systems (IEEE ICOS 2013)
6. IEEE Conference on Wireless Sensors (IEEE ICWiSe 2013)
7. Symposium on Network Cloud Computing and Applications (IEEE NCCA 2012)

Sponsored Research

Proposals under Review

1. "High Performance Fault-Tolerant Memory Transactions: Active Replication Protocol-based STM and an Open JDK Virtual Machine Implementation," White Paper, Award Period: 10/1/13 – 9/30/16, Source: US Air Force Office of Scientific Research, PIs: B. Ravindran (PI) and R. Palmieri (Co-PI), Total amount of project: $564,808.00
2. "Scaling Up Transactional Memory from 250K to One Million Transactions," White Paper, Award Period: 10/1/13 – 9/30/16, Source: DARPA, PIs: B. Ravindran (PI) and R. Palmieri (Co-PI), Total amount of project: $897,721
3. "High Performance Memory Transactions and Transactional Collections," White Paper, Award Period: TBD, Source: US Army Research Office, PIs: B. Ravindran (PI) and R. Palmieri (Co-PI), Total amount of project: TBD
4. "Fault-Tolerant Software Systems for Multicore Architectures: Transactional Architecture, Protocols, and Framework," White Paper, Award Period: TBD, Source: US Army Research Office, PIs: B. Ravindran (PI) and R. Palmieri (Co-PI), Total amount of project: TBD

Participation in Research Projects

1. *"HyFlowTM"*
   Type: Research project founded by NSF grants
   Role: Researcher/Leader
   Start Date: 2011
2. *"Cloud-TM"*
   Type: FP7 Strep
   Role: Researcher of CINI (Italy) team
   Start Date: June 2010
   Ending Date: June 2013
   Partners: INESC-ID (coordinator), CINI (IT), Algorithmica S.r.l (IT), Red Hat Limited (IE)
3. *"ARISTOS"*
   Type: FCT - All Scientific Domains 2009
   Role: Researcher
   Start date: Feb 2010
   End date: Feb 2013
   Participants: Inesc-ID (PT), Sapienza Rome University (Italy)
4. *"Transactional Memories: Foundations, Algorithms, Tools, and Applications (Euro-TM)"*
   Type: Cost Action
   Role: Researcher
   Start Date: fall 2010
   Ending Date: fall 2014
   Prospective Partners: 42 institutions, 12 Countries

Technical Skills

1. Programming Languages: Java (J2SE, J2EE), C++, C, PHP, Assembly, CUDA
2. Middlewares: JBoss AS, GlassFish, Apache Tomcat
3. Web Service Technologies: XML, SOAP, UDDI, WSDL, WS-RX
4. DBMS: expertise on a large number of commercial and open-source products, e.g., IBM DB2, Oracle, SQL Server, MySQL
5. Data Grid: deep knowledge of Infinispan (Red Hat), an open-source key-value store
6. Management solution: deep knowledge of RHQ (Red Hat), an open-source enterprise management solution for middleware
7. Operating Systems: expertise as system administrator, shell and system programmer with both Linux and Windows operating systems

References

1. Binoy Ravindran
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   Virginia Tech
   302 Whittemore Hall
   Blacksburg, VA 24061, USA
   Phone: 540-231-3777, E-mail: binoy@vt.edu
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2. Francesco Quaglia
   Associate Professor
   DIAG - Department of Computer, Control, and Management Engineering Antonio Ruberti
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   Web: `http://www.dis.uniroma1.it/~quaglia`
3. Paolo Romano
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