Konrad SIEK

konrad.siek@cs.put.edu.pl
www.cs.put.poznan.pl/ksiek/

I am passionate about transactional memory, concurrency, distributed systems, and functional programming. I enjoy research and development work, as well as teaching. I seek difficult ways to solve simple problems and sometimes *vice versa*.

EDUCATION

Ph.D. in Computing Science at Poznań University of Technology Oct 2009 – Nov 2016 (est.)
Dissertation: Konrad Siek. *Distributed pessimistic transactional memory: algorithms and properties.* Advisor: Paweł T. Wojciechowski. Submitted June 2016. Available on-line.[1]

Master's Degree in Computing Science at Poznań University of Technology Feb 2008 – Sep 2009
Specialization: Software Engineering.
Thesis: Konrad Siek. *Design and implementation of a Java source code precompilation tool for static analysis and modification of programs for the Atomic RMI library.* Advisor: Paweł T. Wojciechowski.

Engineering Degree in Computing Science at Poznań University of Technology Oct 2004 – Feb 2008
Thesis: Joanna Daukszewicz, Tomasz Kaszkowiak, Paweł Martenka, Konrad Siek. *Amebae – wieloosobowy komunikator programistyczny* (*Amebae—a group instant messenger for developers*). Advisor: Bartosz Walter. (Contribution: source code parsing and highlighting, distributed text processing.)

Bachelor of Arts Degree in English Philology at PWSZ in Piła[2] Oct 2004 – Jun 2007
Thesis: Konrad Siek. *Computer assisted language learning software—experimental study.* Advisor: Anna Szczepaniak-Kozak.

EMPLOYMENT

Research Assistant at Poznań University of Technology Jan 2013 – now
Research work and teaching in the Distributed Systems Group.[3]

Research work (publications listed separately):
- pessimistic transactional memory concurrency control algorithms,
- distributed transactional memory implementation in Java (Atomic RMI),[4]
- theoretical work on safety properties and the impact of reading from live transactions on consistency,
- benchmark design for distributed transactional memory and implementation in Java, Groovy, and Scala,
- eventual consistency, scheduling, and static analysis in the context of transactional memory.

Projects:
- COST Action IC1001, Euro-TM[5] (substitute management committee member for Poland),
- NCN Grant No. 2012/06/M/ST6/00463: Consistency control and fault tolerance for distributed software transactional memory (researcher),
- NCN Grant No. 2012/07/B/ST6/01230: Eventually consistent replication: algorithms and methods (researcher),
- Project No. POIG.01.03.01-00-008/08: IT-SOA[6] (maintainer).

Laboratory courses taught: operating systems (Bash and C systems programming), computer networks, functional programming (Scala), basic IT (for medical students).

I also worked with students as an assistant supervisor on engineering and masters' theses (listed separately).

Senior Clerk in the IT-SOA Project[6] at Poznań University of Technology Jun 2010 – Dec 2012
Research and development in distributed transactional memory, including implementation of concurrency control algorithms, maintenance, documentation, and extensive evaluation of the Atomic RMI library. Teaching basic IT and operating systems laboratory courses.

Developer in the IT-SOA Project[6] at Poznań University of Technology Mar 2009 – Jun 2010
Research and development in static analysis, including design and implementation of a tool for the assessment of an upper bound on remote method calls in Java code and source-level instrumentation for use with the Atomic RMI library.[6]

Developer at PSI Poland[7] Jul 2008 – Jul 2009
Development and maintenance of sequencing systems (front-end and back-end) for car production facilities as part of a contract for F/L/S in Dortmund[8] (now part of PSI), including implementation work, and writing analyses, requirement and change specifications, and technical documentation.

Apprentice Teacher at No. 4 Elementary School in Piła Sep 2005 – Sep 2006
Teaching English to 6th graders in a classroom setting under the supervision of a senior teacher. Conducting laboratories and tutorials for difficult students using computer assisted language learning tools, some of which I developed myself.

VOLUNTEER WORK

Student Club Coordinator Apr 2012 – now
Co-founding and coordination of the activities of the Distributed Systems and Computer Networks Student Club at the Faculty of Computing Science at Poznań University of Technology.[9] Organization of workshops and tutorials, giving technical talks, taking part in organizing open source conferences (PIWO X and PIWO XI),[10] and advising on distributed computing projects.

Volunteer Developer Jun 2007 – Oct 2007
Development and deployment of a CMS system for the District Municipal Public Library in Piła[11] as a volunteer project. The system was used for several years but was recently replaced.

SKILLS

Programming
Java, Python, Scala, Groovy, OCaml, Bash, and others. Knowledge of the functional paradigm and concurrent programming skills. Particular experience writing lexers and parsers and byte code manipulation on the JVM as well as distributed programming, especially with RMI and the actor model. Worked on code professionally in the industry, in academia, and for personal enjoyment.[12] A lot of experience working with other people's code.

Research
Experience doing research and development work in distributed systems and transactional memory. Propensity for theoretical work with particular interest in modeling and determining the safety and consistency of concurrent systems.

Technical Writing
Experience writing technical and scientific journal and conference papers, and technical documentation for development projects. Good LaTeX skills.

Teaching
A trained and experienced teacher, having taught English and various computer science laboratory courses. Additional experience organizing students and working with them outside of the classroom context.

Languages
Fluent English speaker and native speaker of Polish. Vey limited use of French and Russian.

I also draw, play strategy games badly, listen to audiobooks, and swing a *shinai*.

PUBLICATIONS

Journal Papers

K. Siek and P. T. Wojciechowski. Proving opacity of transactional memory with early release. *Foundations of Computing and Decision Sciences*, Volume 40, Issue 4. December 2015.

K. Siek and P. T. Wojciechowski. Atomic RMI: A distributed transactional memory framework. *International Journal of Parallel Programming*, Volume 44, Issue 3. June 2015.

Journal Papers Being Prepared

K. Siek and P. T. Wojciechowski. Atomic RMI 2: Highly parallel pessimistic distributed transactional memory. *IEEE Transactions on Parallel and Distributed Systems*, April 2016. ArXiv:`1606.03928 [cs.DC]`. (Submitted for publication.)

J. Baranowski, P. Kobyliński, K. Siek, and P. T. Wojciechowski. Helenos: A realistic benchmark for distributed transactional memory. ArXiv:`1603.07899 [cs.DC]`. (In preparation.)

K. Siek and P. T. Wojciechowski. Transactions scheduled while you wait. *Journal of Grid Computing*, October 2015. (Submitted for publication.)

K. Siek and P. T. Wojciechowski. Last-use opacity: A strong safety property for transactional memory with early release support. ArXiv:`1506.06275 [cs.DC]`. (In preparation.)

P. T. Wojciechowski and K. Siek. The optimal pessimistic transactional memory algorithm. ArXiv:`1605.01361 [cs.DC]`. (In preparation.)

Book Chapters

K. Siek, P. T. Wojciechowski, P. Kujawa, A. Perek, J. Richter, and S. Staszyński. Source-level static analysis and instrumentation. In T. Biały, C. Sobaniec, M. Sobczak, B. Walter, and W. Wróblewski, editors, *Information Technology and its Applications*. Nakom, December 2011.

K. Siek, A. Wojciechowski, Barcodes versus matrix codes: an experimental comparison of recognition quality from mobile phone camera photos. In Waldemar Wolski and Mariusz Borawski, editors, *Computer Graphics: Selected Issues*. University of Szczecin, Faculty of Economics and Management, 2010. 6 points.

Conference and Workshop Papers

K. Siek and P. T. Wojciechowski. Brief announcement: Relaxing opacity in pessimistic transactional memory. In *Proceedings of DISC'14: the 28th International Symposium on Distributed Computing*, October 2014.

K. Siek and P. T. Wojciechowski. Atomic RMI: a distributed transactional memory framework. In *Proceedings of HLPP'14: the 7th International Symposium on High-level Parallel Programming and Applications*, July 2014.

K. Siek and P. T. Wojciechowski. Zen and the art of concurrency control: An exploration of TM safety property space with early release in mind. In *Proceedings of WTTM'14: the 6th Workshop on the Theory of Transactional Memory (co-located with ACM PODC'14)*, July 2014.

P. T. Wojciechowski and K. Siek. Having your cake and eating it too: Combining strong and eventual consistency. In *Proceedings of PaPEC'14: the 1st Workshop on the Principles and Practice of Eventual Consistency (co-located with ACM SIGOPS EuroSys 2014)*, April 2014.

K. Siek and P. T. Wojciechowski. Brief announcement: Towards a fully-articulated pessimistic distributed transactional memory. In *Proceedings of SPAA'13: the 25th ACM Symposium on Parallelism in Algorithms and Architectures*, July 2013.

K. Siek and P. T. Wojciechowski. A formal design of a tool for static analysis of upper bounds on object calls in Java. In *Proceedings of FMICS'12: the 17th International Workshop on Formal Methods for Industrial Critical Systems (co-located with FM'12)*, number 7437 in Lecture Notes in Computer Science, August 2012.

P. T. Wojciechowski and K. Siek. Transaction concurrency control via dynamic scheduling based on static analysis. (Extended abstract.) In *Proceedings of WTM'12: the Euro-TM Workshop on Transactional Memory (co-located with ACM SIGOPS EuroSys 2012)*, April 2012.

K. Siek and P. T. Wojciechowski. Statically computing upper bounds on object calls for pessimistic concurrency control. In *Proceedings of EC^2'10: the Workshop on Exploiting Concurrency Efficiently and Correctly (co-located with CAV'10, part of FLoC'10)*, July 2010.

A. Wojciechowski and K. Siek. Barcode scanning from mobile-phone camera photos delivered via MMS: Case study. In *Proceedings of M2AS'08: the 1st International Workshop on Modeling Mobile Applications and Services* (co-located with ER'08), October 2008.

MISCELLANEOUS

Short Term Scientific Mission
Konrad Siek. *A formalism for distributed transactional memory models.* September 2014. Hosted by Rachid Guerraoui at École Polytechnique Fédérale de Lausanne.

Summer Schools
Transform Summer School on Research in Distributed Computing. June 10–14, 2013, Heraklion, Greece. Presentation: *Rollbacks in pessimistic distributed TM.*

Third International Summer School on Trends in Concurrency. May 23–30, 2010, Bangalore, India. Short presentation during the doctoral session: *Statically computing Upper bounds on object calls for pessimistic concurrency control.*

Student Thesis Supervision
K. Kozubal, J. Cieślak. *Hummy – Implementacja rozproszonej pamięci transakcyjnej z naciuskiem na wydajność. (Hummy—An implementation of distributed transactional memory focused on performance.)* Engineering thesis. Poznań University of Technology, 2016. Advisor: P. T. Wojciechowski. Assistant supervisor: K. Siek.

M. Witczak. *Atomic Café – Rozproszony system zarządzania odtwarzaniem mediów. (Atomic Café—A distributed multimedia playback system.)* Master's thesis. Poznań University of Technology, 2015. Advisor: P. T. Wojciechowski. Assistant supervisor: K. Siek.

J. Baranowski. *Programy wzorcowe do ewaluacji rozproszonej pamięci transakcyjnej. (Benchmarks for evaluating distributed transactional memory.)* Master's thesis. Poznań University of Technology, 2015. Advisor: P. T. Wojciechowski. Assistant supervisor: K. Siek.

[1] http://www.cs.put.poznan.pl/ksiek/research/
[2] http://www.pwsz.pila.pl/
[3] https://dsg.cs.put.poznan.pl/
[4] https://github.com/kondziu/AtomicRMI/
[5] http://www.eurotm.org/
[6] https://www.soa.edu.pl/
[7] http://www.psi.pl/
[8] http://www.fuzzy.de/
[9] https://dsg.cs.put.poznan.pl/wiki/
[10] http://piwo.informatyka.org/
[11] https://www.biblioteka.pila.pl/
[12] http://grittyscripts.blogspot.com/