

SAGAR JYOTI CHAKI  
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## Research Interests:

- Formal methods
- Specification, verification, analysis and testing of software
- Concurrency and software security
- Verification of Real-time and Cyber-Physical Systems

## Education:

<b>Carnegie Mellon University (CMU)</b> Pittsburgh, USA	<b>Ph.D., Computer Science</b> Dissertation topic: <i>A counterexample guided abstraction refinement framework for verifying concurrent C programs</i> Adviser: Prof. Edmund M. Clarke <b>Microsoft Graduate Student Fellow</b>	<b>1999 - 2005</b>
<b>Indian Institute of Technology (IIT)</b> Kharagpur, India	<b>B.Tech.(Hons.), Computer Science &amp; Engineering</b> Dissertation: <i>Symbolic and automata-theoretic model checking for timed abstraction of Verilog descriptions.</i> Advisers: Prof. P. P. Chakrabarti & Prof. P. Dasgupta GPA: <b>9.82/10</b> , <b>President of India Gold Medal</b>	<b>1995 - 1999</b>

## Professional and research experience:

- **Mentor Graphics** (September 2017 - Present).
- **CDRA Project at SEI** (October 2016 - September 2017) Co-lead SEI-funded project *Certifiable Distributed Runtime Assurance*.
- **DART Project at SEI** (October 2014 - September 2016) Co-lead SEI-funded project *Verifying Distributed Adaptive Real-Time Systems*.
- **IR&D at SEI** (October 2015 - September 2016) Co-lead SEI-funded IR&D project *Auto-Active Verification of Software with Timers and Clocks*.
- **IR&D at SEI** (October 2014 - September 2015) Co-lead SEI-funded IR&D project *Parallel Software Model Checking*.
- **HCCPS Project at SEI** (July 2013 - September 2014) Co-lead SEI-funded project *High-Confidence Cyber-Physical Systems*.
- **IR&Ds at SEI** (October 2013 - September 2014) Participated in three SEI-funded IR&Ds:
  - *Verifying Evolving Software*.
  - *Contract-Based Virtual Integration of CPS Analyses*.
  - *Software Model Checking for Verifying Distributed Algorithms*.
- **IR&Ds at SEI** (October 2012 - September 2013) Participated in two SEI-funded IR&Ds:
  - *Next Generation Malware Disassembly Algorithms*.
  - *Reverse Engineering Object Oriented Data and Methods*.
- **IR&Ds at SEI** (October 2011 - September 2012) Participated in two SEI-funded IR&Ds:

- *Semantic Comparison of Malware Functions.*
- *Semantic Analysis for Malware Code Deobfuscation.*
- **IR&Ds at SEI** (October 2010 - September 2011) Co-lead two SEI-funded IR&Ds:
  - *Learning a Portfolio-Based Checker for Provenance-Similarity of Binaries.* Details at: <http://www.contrib.andrew.cmu.edu/~schaki/binsim/index.html>.
  - *Regression Verification of Real-time Embedded Software.*
- **RTSS Program at Software Engineering Institute (SEI)** (June 2008 - June 2013) Investigating use of formal methods, particularly model checking and static analysis, for verifying and certifying properties related to safety, liveness, and security of software. Details at: <http://www.sei.cmu.edu/programs/rtss>.
- **PACC Initiative at Software Engineering Institute (SEI)** (September 2004 - May 2008) Investigating use of formal methods, particularly model checking, for verifying properties related to safety, liveness, and security of component-based software systems. Details at: <http://www.sei.cmu.edu/pacc>.
- **Software Certification IR&D at SEI** (October 2005 - September 2006) Co-lead SEI-funded Independent Research & Development (IR&D) project on generating *Certified Binaries for Software Components* by combining source code certification techniques with off-the-shelf compilers. Report available at: <http://www.sei.cmu.edu/library/abstracts/reports/07tr006.cfm>.
- **IR&Ds at SEI** (October 2004 - September 2005) Participated in two SEI-funded IR&Ds:
  - *Assessing and Demonstrating the Readiness of Proof-Carrying Code (PCC) for Obtaining Objective Trust in Software Components.*
  - *Verification of Evolving Software via Component Substitutability Analysis.*

Report available at: <http://www.sei.cmu.edu/library/abstracts/reports/05tr020.cfm>.

- **MAGIC project at CMU** (December 2001 - August 2004) Developed a framework for automated and compositional verification of concurrent C programs. Basis of my Ph.D. dissertation. Details and download at: <http://www.cs.cmu.edu/~chaki/magic>.
- **SPEAR project at CMU** (December 1999 - August 2004) Developed and implemented algorithms for efficient matching in publish-subscribe systems using Binary Decision Diagrams (BDDs). Details and download at: <http://www.cs.cmu.edu/~chaki/spear>.
- **Summer Intern at Microsoft Research (MSR)** (May 2001 - July 2001) Worked in the Software Productivity Tools (SPT) group on type-based model extraction and verification of concurrent  $\pi$ -Calculus programs. Implemented a tool, PIPER, that (i) extracts a CCS model from a  $\pi$ -Calculus program using user-supplied annotations, (ii) translates the CCS model to Promela and (iii) verifies it using the SPIN model checker.
- **Summer Intern at MSR** (May 2000 - July 2000) Worked in the SLAM project (SPT group) on the verification of concurrent Boolean programs. Implemented a tool, BEACON, for verifying safety properties of thread-safe libraries and used it to verify critical safety properties of a thread-safe memory manager developed at MSR.
- **Computer Architecture Project at CMU** (October 1999 - November 1999) Worked on a technique for hiding load latencies using previous register values in modern superscalar processors. Simulations done using the SimpleScalar toolkit indicated considerable performance gains for Spec95 benchmarks. Project report at <http://www.cs.cmu.edu/~chaki/740proj>.
- **B.Tech. Dissertation at IIT** (July 1997 - April 1998) Developed symbolic model checker using the CUDD BDD package to verify timed properties of Verilog descriptions of systems.
- **Design Lab project at IIT** (January 1999 - April 1999) Developed C++ libraries similar to Parallel Virtual Machine (PVM) to support distributed applications on a network of workstations.

- **Other Projects at IIT** (1995 - 1999) Compiler for a subset of C; hardware implementation of a 4-bit CPU; hardware/firmware for a real time object counter; design and implementation of a time division multiplexer; development of a graphical editor using X-Motif etc.
- **Summer Intern at Tata Consultancy Services (TCS), Calcutta, India.** (May 1998 - July 1998) Developed web-based Problem Management Utility using Lotus Notes to maintain a database of hardware and software problems faced by TCS, their solutions and other details.

### Invited Talks:

- Midwest Verification Day (MVD), Ames, IA, October 22, 2016, Keynote.
- High Confidence Software and Systems Conference (HCSS), Annapolis, MD, May 10, 2016, Keynote.
- IFIP WG 2.4 Meeting, Asilomar, CA, USA, February 4, 2014.
- ACM SigADA High Integrity Language Technology Conference, Pittsburgh, PA, November 11, 2013, Invited Tutorial.
- Oregon State University, Corvallis, OR, October 21, 2013.
- Indian Institute of Technology, Kharagpur, India, July 29, 2013.
- IFIP WG 2.4 Meeting, Mysore, India, March 19, 2013.
- Infosys, Bangalore, India, June 13, 2012.
- Indian Institute of Science, Bangalore, India, June 11, 2012.
- IFIP WG 2.4 Meeting, Vadstena, Sweden, May 21, 2012.
- Microsoft Research, Redmond, WA, February 6, 2003, and November 20, 2008.
- General Motors India Science Lab, Bangalore, 1 July 2008.
- Microsoft Research, Bangalore, India, 30 June 2008.
- Calypto Design Systems Inc., Santa Clara, CA, November 13, 2006 and April 8, 2009.
- XOOTIC 2006 Symposium, Eindhoven, The Netherlands, September 21, 2006.
- Vulnerability Analysis Branch, US Department of Defense, November 21, 2003.

### Awards and Honors:

- **Microsoft Graduate Fellowship**, 2001-2003.
- Carnegie Mellon Computer Science Departmental Fellowship, Sep 1999 to August 2004.
- **President of India Gold Medal** at IIT for best academic performance in batch.
- **President of India Silver Medal** at IIT for best academic performance in department.
- Jagadis Bose National Science Talent Search (JBNSTS) scholarship, June 1995 to June 1999
- B. P. Poddar Merit Scholarship, July 1998 to April 1999.
- Annual awards at IIT for best academic performance in the batch.

### Professional Activities:

- **Service:** NSF Panels (2006, 2007, 2011, 2012, 2014, 2016, 2017), SVV 2006 PC, LPAR 2008 PC, SPIN 2011 PC, AVICPS 2012 PC co-chair, SPIN 2015 PC, SESCPS 2015 PC, SSS 2015 PC, FASE 2016 PC, SESCPS 2016 PC, FASE 2017 PC, CAV 2016 ERC, ISEC 2016 PC, CISE 2017 PC, AAMAS 2017 PC, SESCPS 2017 PC, SPIN 2017 PC, FASE 2018 PC, HILT 2018 PC, ISEC 2019 PC.
- **Conference Reviews:** APLAS, CAV, FOSSACS, FSTTCS, POPL, TACAS, VMCAI, LICS.
- **Journal Reviews:** ISSTA, LMCS, TCS, TECS, TOSEM, TSE, TISSEC, TEDS.
- **Membership:** IEEE Senior Member, ACM Senior Member.

## Development Skills:

- **OS:** Unix and variants, Windows (Win32), MS DOS development.
- **Languages:** C, C++, Lex, Yacc, Java, Ocaml, Perl, Promela, Verilog, SQL, Fortran 77, HTML, and MIPS / Alpha / x86 assembly.
- **Development:** Verification using CUDD; programmable logic and micro-controller based logic design; development of parallel programs using threads; development of network applications using Berkeley sockets; GUI development using X-Motif.

**Publications:** (Details at <https://chaki.bitbucket.io/publications.html>).

## Book Chapters

- BDD-Based Symbolic Model Checking, *Handbook of Model Checking*, Sagar Chaki, Arie Gurfinkel, 2018.

## Refereed Journal Papers

- SMT-based model checking for recursive programs, *Formal Methods in System Design (FMSD)*, Anvesh Komuravelli, Arie Gurfinkel, Sagar Chaki, 2016.
- Regression Verification for Multi-Threaded Programs (With extensions to locks and dynamic thread creation), *Formal Methods in System Design (FMSD)*, Sagar Chaki, Arie Gurfinkel, Ofer Strichman, 2015.
- Verification across Intellectual Property Boundaries, *ACM Transactions on Software Engineering and Methodology (TOSEM)*, Sagar Chaki, Christian Schallhart, Helmut Veith, 2013.
- Automated assume-guarantee reasoning for omega-regular systems and specifications, *Innovations in Systems and Software Engineering (ISSE)*, Sagar Chaki, Arie Gurfinkel, 2011.
- Combining predicate and numeric abstraction for software model checking, *Software Tools for Technology Transfer (STTT)*, Arie Gurfinkel, Sagar Chaki, 2010.
- Software Model Checking without Source Code, *Innovations in Systems and Software Engineering (ISSE)*, Sagar Chaki, James Ivers, 2010.
- Verification of Evolving Software via Component Substitutability Analysis, *Formal Methods in System Design (FMSD)*, Sagar Chaki, Edmund Clarke, Natasha Sharygina, Nishant Sinha, 2008.
- Three Optimizations for Assume-Guarantee Reasoning with  $L^*$ , *Formal Methods in System Design (FMSD)*, Sagar Chaki, Ofer Strichman, 2008.
- Concurrent Software Verification with States, Events and Deadlocks, *Formal Aspects of Computing Journal (FACJ)*, Sagar Chaki, Edmund Clarke, J el Ouaknine, Natasha Sharygina, Nishant Sinha, 2005.
- An Iterative Framework for Simulation Conformance, *Journal of Logic and Computation (JLC)*, Sagar Chaki, Edmund Clarke, Somesh Jha, Helmut Veith, 2005.
- Error Explanation with Distance Metrics, *International Journal on Software Tools for Technology Transfer (STTT)*, Alex Groce, Sagar Chaki, Daniel Kroening, Ofer Strichman, 2005.
- Modular Verification of Software Components in C, *Transactions on Software Engineering (TSE)*, Sagar Chaki, Edmund Clarke, Alex Groce, Somesh Jha, Helmut Veith, 2004.
- Efficient Verification of Sequential and Concurrent C Programs, *Formal Methods in System Design (FMSD)*, Sagar Chaki, Edmund Clarke, Alex Groce, J el Ouaknine, Ofer Strichman, Karen Yorav, 2004.

## Refereed Conference and Workshop Papers

- High Coverage Concolic Equivalence Checking, in *Proc. of the 22nd Design, Automation and Test in Europe Conference (DATE), 2019*, Pritam Roy, Sagar Chaki, Pankaj Chauhan.
- Have your PI and Eat it Too: Practical Security on a Low-cost Ubiquitous Computing Platform, in *Proc. of the 3rd IEEE European Symposium on Security and Privacy (EUROS&P), 2018*, Amit Vasudevan, Sagar Chaki.

- Formal Verification of a Timing Enforcer Implementation, in *Proc. of the International Conference on Embedded Software (EMSOFT)*, 2017, Sagar Chaki, Dionisio de Niz.
- Combining Symbolic Runtime Enforcers for Cyber-Physical Systems, in *Proc. of the 17th International Conference on Runtime Verification (RV)*, 2017, Bjorn Andersson, Sagar Chaki, Dionisio de Niz.
- Decision-Making with Cross-Entropy for Self-Adaptation, in *Proc. of the 12th International Symposium on Software Engineering for Adaptive and Self-Managing Systems (SEAMS)*, 2017, Gabriel A. Moreno, Sagar Chaki, Ofer Strichman, Radislav Vaisman.
- Certifiable Runtime Assurance of Distributed Real-Time Systems (Invited), in *Session on Run-Time Assurance for Adaptive and Intelligent Systems at AIAA SciTech (AIAA SCITECH)*, 2017, Sagar Chaki, Dionisio De Niz.
- Software Solutions for Distributed Autonomous Multi-Functional Robotics in Space, in *AIAA Space and Astronautics Forum and Exposition (AIAA SPACE)*, 2016, James Edmondson, Sagar Chaki, Jeff Hansen, David Kyle.
- Input Attribution for Statistical Model Checking using Logistic Regression, in *Proc. of the 16th International Conference on Runtime Verification (RV)*, 2016, Jeffery Hansen, Sagar Chaki, Scott Hissam, James Edmondson, Gabriel Moreno, David Kyle.
- Verifying Cyber-Physical Systems by Combining Software Model Checking with Hybrid Systems Reachability, in *Proc. of the International Conference on Embedded Software (EMSOFT)*, 2016, Stanley Bak, Sagar Chaki.
- Contract-Based Verification of Timing Enforcers, in *Proc. of ACM SIGAdas High Integrity Language Technology International Workshop on Model-Based Development and Contract-Based Programming (HILT)*, 2016, Sagar Chaki, Dionisio de Niz.
- Modeling, Verifying, and Generating Software for Distributed Cyber-Physical Systems using DMPL and AADL (Abstract Only), in *Proc. of ACM SIGAdas High Integrity Language Technology International Workshop on Model-Based Development and Contract-Based Programming (HILT)*, 2016, Sagar Chaki, Dionisio de Niz, Joseph Seibel.
- ÜBERSPARK: Enforcing Secure Object Abstractions for Automated Compositional Security Analysis of a Hypervisor, in *Proc. of the 25th USENIX Security Symposium (USENIX Security)*, 2016, Amit Vasudevan, Sagar Chaki, Petros Maniatis, Limin Jia, Anupam Datta.
- BUZZ: Testing Context-Dependent Policies in Stateful Networks, in *Proc. of the 13th USENIX Symposium on Networked Systems Design and Implementation (NSDI)*, 2016, Seyed K. Fayaz, Tianlong Yu, Yoshiaki Tobioka, Sagar Chaki, Vyas Sekar.
- Model Checking with Multi-Threaded IC3 Portfolios, in *Proc. of the 17th International Conference on Verification, Model Checking and Abstract Interpretation (VMCAI)*, 2016, Sagar Chaki, Derrick Karimi.
- Statistical Model Checking of Distributed Adaptive Real-Time Software, in *Proc. of the 15th International Conference on Runtime Verification (RV)*, 2015, David Kyle, Jeffery Hansen, Sagar Chaki.
- Eliminating Inter-Domain Vulnerabilities in Cyber-Physical Systems: An Analysis Contracts Approach, in *Proc. of the 1st ACM Workshop on Cyber-Physical Systems Security & Privacy (CPS-SPC)*, 2015, Ivan Ruchkin, Ashwini Rao, Dionisio de Niz, Sagar Chaki, David Garlan.
- High Assurance for Distributed Cyber Physical Systems, in *Proc. of the Architecting Self-Managing Distributed Systems Workshop (ASDS)*, 2015, Scott Hissam, Sagar Chaki, Gabriel Moreno.
- Semantic Importance Sampling for Statistical Model Checking, in *Proc. of the 21st International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS)*, 2015, Jeffery Hansen, Lutz Wraage, Sagar Chaki, Dionisio De Niz, Mark Klein.
- Verification of Real-Time Systems using Statistical Model Checking, in *Proc. of the 2nd Software Challenges in Aerospace Symposium, held as a special session of the AIAA SciTech (AIAA SCITECH)*, 2015, Jeffery Hansen, Lutz Wraage, Sagar Chaki, Dionisio De Niz, Mark Klein.

- Efficient Verification of Periodic Programs using Sequential Consistency and Snapshots, in *Proc. of Formal Methods in Computer-Aided Design (FMCAD)*, 2014, Sagar Chaki, Arie Gurfinkel, Nishant Sinha.
- Optimizing Robotic Team Performance with Probabilistic Model Checking, in *Proc. of the International Conference on Simulation, Modeling, and Programming for Autonomous Robots (SIMPAN)*, 2014, Sagar Chaki, Joseph Giampapa, David Kyle, John Lehoczky.
- Contract-Based Integration of Cyber-Physical Analyses, in *Proceedings of the International Conference on Embedded Software (EMSOFT)*, 2014, Ivan Ruchkin, Dionisio De Niz, Sagar Chaki, David Garlan.
- Model-Driven Verifying Compilation of Synchronous Distributed Applications, in *Proc. of the ACM/IEEE 17th International Conference on Model Driven Engineering Languages and Systems (MODELS)*, 2014, Sagar Chaki, James Edmondson.
- Toward Parameterized Verification of Synchronous Distributed Applications, in *Proc. of the 21st International SPIN Symposium on Model Checking of Software (SPIN)*, 2014, Sagar Chaki, James Edmondson.
- SMT-based Model Checking for Recursive Programs, in *Proc. of the 26th International Conference on Computer Aided Verification (CAV)*, 2014, Anvesh Komuravelli, Arie Gurfinkel, Sagar Chaki.
- Recovering C++ Objects From Binaries Using Inter-Procedural Data-Flow Analysis, in *Proc. of the 3rd ACM SIGPLAN Program Protection and Reverse Engineering Workshop (PPREW)*, 2014, Wesley Jin, Cory Cohen, Charles Hines, Sagar Chaki, Arie Gurfinkel, Jeffrey Havrilla, Priya Narasimhan.
- Finding errors in Python programs using dynamic symbolic execution, in *Proc. of the 25th IFIP International Conference on Testing Software and Systems (ICTSS)*, 2013, Samir Sapra, Marius Minea, Sagar Chaki, Arie Gurfinkel, Edmund M. Clarke.
- Verifying Periodic Programs with Priority Inheritance Locks, in *Proc. of Formal Methods in Computer-Aided Design (FMCAD)*, 2013, Sagar Chaki, Arie Gurfinkel, Ofer Strichman.
- Probabilistic Verification of Coordinated Multi-Robot Missions, in *Proc. of the 20th International SPIN Symposium on Model Checking of Software (SPIN)*, 2013, Sagar Chaki, Joseph Giampapa.
- Automatic Abstraction in SMT-Based Unbounded Software Model Checking, in *Proc. of the 25th International Conference on Computer Aided Verification (CAV)*, 2013, Anvesh Komuravelli, Arie Gurfinkel, Sagar Chaki, Edmund Clarke.
- Design, Implementation and Verification of an eXtensible and Modular Hypervisor Framework, in *Proc. of the 34th IEEE Symposium on Security and Privacy (OAKLAND)*, 2013, Amit Vasudevan, Sagar Chaki, Limin Jia Jonathan McCune, James Newsome, Anupam Datta.
- Compositional Sequentialization of Periodic Programs, in *Proc. of the 14th International Conference on Verification, Model Checking and Abstract Interpretation (VMCAI)*, 2013, Sagar Chaki, Arie Gurfinkel, Soonho Kong, Ofer Strichman.
- Toward A Quantitative Method for Assuring Coordinated Autonomy, in *Proc. of the AAMAS Workshop on Autonomous Robots and Multirobot Systems (ARMS)*, 2013, Sagar Chaki, John M. Dolan, Joseph Andrew Giampapa.
- UFO: Verification with Interpolants and Abstract Interpretation (Competition Contribution), in *Proc. of the 19th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS)*, 2013, Aws Albarghouthi, Arie Gurfinkel, Yi Li, Sagar Chaki, Marsha Chechik.
- Binary Function Clustering using Semantic Hashes, in *Proc. of the 11th International Conference on Machine Learning and Applications (ICMLA)*, 2012, Wesley Jin, Sagar Chaki, Cory Cohen, Arie Gurfinkel, Jeffrey Havrilla, Charles Hines, Priya Narasimhan.
- Non-Preemptive Scheduling with History-Dependent Execution Time, in *Proc. of Euromicro Conference on Real-Time Systems (ECRTS)*, 2012, Bjorn Andersson, Sagar Chaki, Dionisio de Niz, Brian Dougherty, Russell Kegley, Jules White.
- Parametric Verification of Address Space Separation, in *Proc. of Principles of Security and Trust (POST)*, 2012, Jason Franklin, Sagar Chaki, Anupam Datta, Jonathan M. McCune, Amit Vasudevan.

- Regression Verification for Multi-Threaded Programs, in *Proc. of Verification, Model Checking and Abstract Interpretation (VMCAI), 2012*, Sagar Chaki, Arie Gurfinkel, Ofer Strichman.
- Time-Bounded Analysis of Real-Time Systems, in *Proc. of Formal Methods in Computer-Aided Design (FMCAD), 2011*, Sagar Chaki, Arie Gurfinkel, Ofer Strichman.
- Supervised Learning for Provenance-Similarity of Binaries, in *Proc. of the 17th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD), 2011*, Sagar Chaki, Cory Cohen, Arie Gurfinkel.
- Presentation Only: Efficient Predicate Abstraction of Program Summaries, in *Proc. of the 9th International Workshop on Satisfiability Modulo Theories (SMT), 2011*, Arie Gurfinkel, Sagar Chaki, Samir Sapra.
- Non-Preemptive Fixed-Priority Uniprocessor Scheduling where the Execution Time of a Job Depends on the Scheduling of Jobs that Executed Before it, in *Proc. of the 2nd International Real-Time Scheduling Open Problems Seminar (RTSOPS), 2011*, Bjorn Andersson, Dionisio de Niz, Sagar Chaki.
- Efficient Predicate Abstraction of Program Summaries, in *Proc. of the 3rd NASA Formal Methods Symposium (NFM), 2011*, Arie Gurfinkel, Sagar Chaki, Samir Sapra.
- Formal Verification of Real-Time Embedded Software for Multicore Platforms, in *Proc. of the 1st Analytic Virtual Integration of Cyber-Physical Systems Workshop (AVICPS), 2010*, Sagar Chaki, Arie Gurfinkel.
- BOXES: A Symbolic Abstract Domain of Boxes, in *Proc. of the 17th International Static Analysis Symposium (SAS), 2010*, Arie Gurfinkel, Sagar Chaki.
- Automated Assume-Guarantee Reasoning for Omega-Regular Systems and Specifications, in *Proc. of the 2nd NASA Formal Methods Symposium (NFM), 2010*, Sagar Chaki, Arie Gurfinkel.
- Scalable Parametric Verification of Secure Systems: How to Verify Reference Monitors without Worrying about Data Structure Size, in *Proc. of the 31st IEEE Symposium on Security and Privacy (OAKLAND), 2010*, Jason Franklin, Sagar Chaki, Anupam Datta, Arvind Seshadri.
- Using Architecturally Significant Requirements for Guiding System Evolution, in *Proc. of the 14th European Conference on Software Maintenance and Reengineering (CSMR), 2010*, Ipek Ozkaya, Andres Diaz-Pace, Arie Gurfinkel, Sagar Chaki.
- Decision Diagrams for Linear Arithmetic, in *Proc. of the 9th International Conference on Formal Methods in Computer-Aided Design (FMCAD), 2009*, Sagar Chaki, Arie Gurfinkel, Ofer Strichman.
- Verifying Information Flow Control Over Unbounded Processes, in *Proc. of the 16th International Symposium on Formal Methods (FM), 2009*, William Harris, Nicholas Kidd, Sagar Chaki, Somesh Jha, Thomas Reps.
- Assurance Cases for Proofs as Evidence, in *Proc. of Workshop on Proof-Carrying Code and Software Certification (PCC), 2009*, Sagar Chaki, Arie Gurfinkel, Kurt Wallnau, Charles Weinstock.
- ASPIER: An Automated Framework for Verifying Security Protocol Implementations, in *Proc. of the 22nd IEEE Computer Security Foundations (CSF) Symposium, 2009*, Sagar Chaki, Anupam Datta.
- Towards Engineered Architecture Evolution, in *Proc. of the 3rd Workshop on Modeling in Software Engineering (MiSE), 2009*, Sagar Chaki, Andres Diaz-Pace, David Garlan, Arie Gurfinkel, Ipek Ozkaya.
- Software Model Checking without Source Code, in *Proc. of the 1st NASA Formal Methods Symposium (NFM), 2009*, Sagar Chaki, James Ivers.
- Combining Predicate and Numeric Abstraction for Software Model Checking, in *Proc. of the 8th International Conference on Formal Methods in Computer-Aided Design (FMCAD), 2008*, Arie Gurfinkel, Sagar Chaki.
- Combining Predicate and Numeric Abstraction for Software Model Checking (Extended Abstract), in *Proc. of the 6th NASA Langley Formal Methods Workshop (LFM), 2008*, Arie Gurfinkel, Sagar Chaki.
- Model-Driven Construction of Certified Binaries, in *Proc. of the 10th International Conference on Model Driven Engineering Languages and Systems (MODELS) 2007*, Sagar Chaki, James Ivers, Peter Lee, Kurt Wallnau, Noam Zeilberger.

- Verification Across Intellectual Property Boundaries, in *Proc. of the 19th International Conference on Computer Aided Verification (CAV) 2007*, Sagar Chaki, Christian Schallhart, Helmut Veith.
- Optimized L\* for Assume-Guarantee Reasoning, in *Proc. of the 13th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS) 2007*, Sagar Chaki, Ofer Strichman.
- Assume-Guarantee Reasoning for Deadlock, in *Proc. of the 6th International Conference on Formal Methods in Computer-Aided Design (FMCAD) 2006*, Sagar Chaki, Nishant Sinha.
- SAT-based Software Certification, in *Proc. of the 12th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS) 2006*, Sagar Chaki.
- Verifying Concurrent Message-Passing C Programs with Recursive Calls, in *Proc. of the 12th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS) 2006*, Sagar Chaki, Edmund Clarke, Nicholas Kidd, Thomas Reps, Tayssir Touili.
- Parallel Assignments in Software Model Checking, in *Proc. of the 3rd International Workshop on Software Verification and Validation (SVV) 2005*, Murray Stokely, Sagar Chaki, Joel Ouaknine.
- State/Event Software Verification for Branching-Time Specifications, in *Proc. of the 5th International Conference on Integrated Formal Methods (IFM) 2005*, Sagar Chaki, Edmund Clarke, Orna Grumberg, Joel Ouaknine, Natasha Sharygina, Tayssir Touili, Helmut Veith.
- Dynamic Component Substitutability Analysis, in *Proc. of Formal Methods (FM) 2005*, Sagar Chaki, Edmund Clarke, Natasha Sharygina, Nishant Sinha.
- The ComFoRT Reasoning Framework, in *Proc. of the 17th International Conference on Computer Aided Verification (CAV) 2005*, Sagar Chaki, James Ivers, Natasha Sharygina, Kurt Wallnau.
- Automated Assume-Guarantee Reasoning for Simulation Conformance, in *Proc. of the 17th International Conference on Computer Aided Verification (CAV) 2005*, Sagar Chaki, Edmund Clarke, Nishant Sinha, Prasanna Thati.
- Explaining Abstract Counterexamples, in *Proc. of the 12th International Symposium on Foundations of Software Engineering (FSE) 2004*, Sagar Chaki, Alex Groce, Ofer Strichman.
- Automated, compositional and iterative deadlock detection, in *Proc. of the 2nd ACM-IEEE International Conference on Formal Methods and Models for Codesign (MEMOCODE) 2004*, Sagar Chaki, Edmund Clarke, Jöel Ouaknine, Natasha Sharygina.
- State/Event-based Software Model Checking, in *Proc. of the 4th International Conference on Integrated Formal Methods (IFM) 2004*, Sagar Chaki, Edmund Clarke, Jöel Ouaknine, Natasha Sharygina, Nishant Sinha.
- Predicate Abstraction with Minimum Predicates, in *Proc. of the 12th Advanced Research Working Conference on Correct Hardware Design and Verification Methods (CHARME) 2003*, Sagar Chaki, Edmund Clarke, Alex Groce, Ofer Strichman.
- Automated Compositional Abstraction Refinement for Concurrent C Programs: A Two-Level Approach, in *Proc. of the 2nd Workshop on Software Model Checking (SoftMC) 2003*, Sagar Chaki, Jöel Ouaknine, Karen Yorav, Edmund Clarke.
- Integrating Publish/Subscribe into a Mobile Teamwork Support Platform, in *Proc. of the 15th International Conference on Software Engineering and Knowledge Engineering (SEKE) 2003*, Sagar Chaki, Pascal Fenkam, Harald Gall, Somesh Jha, Engin Kirda, Helmut Veith.
- Modular Verification of Software Components in C, an *ACM-SIGSOFT Distinguished Paper in the 25th International Conference on Software Engineering (ICSE) 2003*, pages 385-395, Sagar Chaki, Edmund Clarke, Alex Groce, Somesh Jha, Helmut Veith.
- Types as Models: Model Checking Message Passing Programs, in *Proc. of the 29th Annual ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (POPL) 2002*, Sagar Chaki, Sriram K. Rajamani, Jakob Rehof.
- Parameterized Verification of Multithreaded Software Libraries, in *Proc. of Tools and Algorithms for the Construction and Analysis of Systems (TACAS) 2001*, Thomas Ball, Sagar Chaki, Sriram K. Rajamani.



- Efficient Filtering in Publish-Subscribe Systems using Binary Decision Diagrams, *in Proc. of the 23rd International Conference on Software Engineering (ICSE) 2001*, Alexis Campailla, Sagar Chaki, Edmund Clarke, Somesh Jha, Helmut Veith.
- Abstractions for Model Checking of Event Timings, *in Proc. of IEEE International Symposium on Circuits and Systems (ISCAS) 2001*, Jatindra K. Deka, S. Chaki, Pallab Dasgupta, P. P. Chakrabarti.

**Languages:** Fluent English, native Bengali speaker.

**Personal Interests:** Hindi and Bengali music, playing cricket, reading novels, puzzle solving.

**References:** Available upon request.