

Curriculum Vitae

Personal Information:

Family name, First name: Sagiv, Shmuel Mooly
Date of birth: April 11th, 1959
Gender: Male
Phone: +972-548303111
Nationality: Israeli
Marital status: Married + 3
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Education

1986–1990 *Ph.D.*, Department of Computer Science, Technion, Israel.
Advisors: Prof. Michael Rodeh and Prof. Nissim Francez
Thesis Title: “High Level Formalisms for Program Flow Analysis and their use in Compiling.”
1982–1985 *B.A.*, Department of Computer Science, Technion, Haifa, Israel
Graduated cum laude

Current Position

2008 – Full Professor, Chair of Software Systems School of Computer Science, Tel Aviv University, Israel

GRANTS

2018-2022 I.S.F Grant “Static Analysis of Distributed Protocols”, Jointly with Dr. Sharon Shoham, PI IS 1,120,000
2017-21 B.S.F Grant “Effective Reasoning about Dynamically Evolving Relations” PI (Co-PI: Neil Immerman and Sharon Shoham)
2013-19 **Senior ERC Grant:** “Verifying and Synthesizing Software Compositions” (PI, 1.57 Million Euros)
2011–16 Israel academy of science grant, PI “Enabling Software Scalability Via Dynamic and Static Program Analysis”, (PI, \$240K).
2011–14 Microsoft Research, “Enforcing Automicity for Data Structure Manipulations”, (\$64K).
2011–12 IBM OCR Gift jointly with Alex Aiken (\$500k)
2007–11 Israel academy of science grant, “Specialized Shape Analysis”, PI (1,120K NIS)

Honors and Awards

2016 Microsoft Outstanding Collaborator Award
2016 ACM Fellow
2011,12 Best paper awards, PLDI’ 11, PLDI’ 12
2011 ACM SIGSOFT Impact Paper Award for T. Reps, S. Horowitz, M. Sagiv and G. Rosay. “Speeding-Up Slicing”. In Proc. Second ACM SIGSOFT Symposium on Foundations of Software Engineering.
2000,01,02,04,05 IBM Faculty Awards
2002 The Friedrich Wilhelm Bessel Research Award, granted by the Humboldt Foundation, Germany for Shape Analysis
1993 IBM Outstanding Technical Achievement Award for semi automatically porting the IBM AS/400 operating system to a new platform
1989 Wolf Foundation Fellowship

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1985 Miriam and Aharon Gutwirth Fellowship

Honors and Awards Students

Oded Padon Google PhD Scholarship, Radhia Cousot's award for outstanding student

Ori Lahav Faculty offers from major universities in Israel. Allon Prestigious Fellowship for new faculty in all sciences.

Shachar Itzhaky SIGPLAN John C. Reynolds Dissertation Award 2016 "Automatic Reasoning for Pointer Programs Using Decidable Logics". Faculty offers from major universities in Israel.

Eran Yahav The Eshkol Graduate Fellowship, IBM Fellowship, and Allon Prestigious Fellowship for new faculty in all sciences. Currently Associate Professor at the Technion. Several best paper awards and the Technion Yanai Prize for Excellence in Academic Education. The Cooper Prize for Excellence in research 2016.

Noam Rinetzky IBM graduate scholarship and a Royal Academy of Engineering/EPSRC Research Fellow. Currently Assistant Professor at Tel Aviv University

Roman Manevich The Clore PhD Fellowship. Currently Assistant Professor at Ben-Gurion University.

Greta Yorsh The Eshkol Graduate Fellowship. Currently Lecturer at Queen Mary University. ERC award.

Tal Lev-Ami Adams graduate scholarship, CTO and founder of Cloundinery.

Nurit Dor The Eshkol Graduate Fellowship, CTO of the Panaya Static Analysis company, acquired by InfoSys.

Michal Segalov Anita Borg co-winner for social impact.

Visitors

2015–2016 Dr. Sharon Shoham : "Inferring Inductive Invariants". Currently Faculty member at TAU, ERC award

Postdoctoral Students

2015 Dr. Yaron Velner, Postdoc "Complexity of Network Verification".

2014–15 Dr. Aleksandr Karbyshev, "Property Guided Verification of Dynamically Evolving Systems."

2013–2014 Dr. Ori Lahav, "Effectively Propositional Reasoning". Currently faculty member at TAU.

Doctoral Students

2017– Yotam Feldman (jointly with Sharon Shoham), "Phased Invariant and Invariant Inference"

2017– Shelly Grossman (jointly with Noam Rinetzky), "Modularity of Dynamically Evolving Objects with Applications to Smart Contracts"

2016– Kalev Aplerinas, "Information flow control with applications to cloud computing"

2015– Orr Tamir, "End-to-End Verification of Byzantine Consensus Protocols"

2014–2018 Oded Padon, "Verifying Distributed Protocols"

2009–2014 Guy Guta (jointly with Eran Yahav), Tel-Aviv University. Currently Researcher at VMware Research Lab.

2009–2014 Shachar Itzhaky, Tel-Aviv University, "Automatic Reasoning for Pointer Programs Using Decidable Logics". Currently faculty member and at the Technion.

2009–2013 Omer Tripp, Tel-Aviv University, "Incorporating Data Abstractions into Concurrency Control". Currently research member at Google Mountainview

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- 2007–2012** Ohad Shacham, Tel-Aviv University (jointly with Eran Yahav), "Verifying Atomicity of Composed Concurrent Operations". Currently Research Scientist in the Scalable Systems Research Group at Yahoo Lab
- 2004–2009** Tal Lev-Ami, Tel-Aviv University, "Automatic Maintenance of Transitive Properties with Applications for Shape Analysis". Currently CTO and founder at Clouduary
- 2003–2008** Greta Yorsh, Tel-Aviv University (jointly with Alexander Rabinovich), "Employing Decision Procedures in Abstract Interpretation". Currently Faculty member at Queen Mary University London, ERC Fellowship
- 2003–2008** Noam Rinetzky, Tel-Aviv University "Hierarchical Shape Analysis of Object Oriented Programs". Currently Faculty member at Tel Aviv University
- 2003–2008** Roman Manevich, Tel-Aviv University, "Heap Decompositions". Currently Faculty member at Ben Gurion University
- 1999–2004** Eran Yahav, Tel-Aviv University, "Analyzing Multithreading in Java". Currently Faculty member at Technion Israel
- 2000–2003** Ran Shaham, Tel-Aviv University, "Memory Management in Java using Static Analysis". Currently Inventor Amuse Toy & Game Development
- 1999–2003** Nurit Dor, Tel-Aviv University, "Checking Memory Cleanness". Currently at Research Manager at KayHut

Master Students

- 2014–2016** Kalev Alpernas (Jointly with Sharon Shoham) "Safety Verification of Stateful Networks"
- 2014–2017** Asya Frumklin (Jointly with Sharon Shoham) "Property Directed Reachability for Proving Absence of Concurrent Modification Errors"
- 2013–2015** Ofri Ziv, Tel-Aviv University "Composable Concurrency Control"
- 2012–2015** Hila Peleg (jointly with Eran Yahav)
- 2011–2015** Orr Tamir, Tel-Aviv University (jointly with Noam Rinetzky) "Parallelizing Shortest Path Algorithms for Dense Graphs"
- 2010–2012** Ghila Castelnovo, "Modular Lattices for Compositional Interprocedural Analysis"
- 2007–2009** Michal Segalov, Tel-Aviv University, "Checking linearizability of concurrent implementations"
- 2006–2009** Shachar Yitzhaky, Tel-Aviv University, "Synthesizing Graph Algorithms"
- 2006–2008** Igor Bogodlov, Tel-Aviv University, "Reducing the cost of parametric shape analysis using database optimizations"
- 2005–2008** Sharon-Zvi Goldshlager, Tel-Aviv University, "Producing Counterexamples for static analysis"
- 2005–2008** Uri Juhasz, Tel-Aviv University, "Assume Guarantee Reasoning with Abstraction"
- 2005–2007** Aharon Abadi, Tel-Aviv University, "Proving Specifications with First Order Theorem provers" (jointly with Alexander Rabinovich)
- 2005–2007** Daphna Amit, Tel-Aviv University, "Automatic Proving of Linearizability"
- 2005–2006** Shachar Rubinstein, Tel-Aviv University, "Dynamic heap Profiling"
- 2005–2006** Ronny Morad, Tel-Aviv University, "Garbage Collection of Long-Lived Objects"
- 2005–2006** Guy Gueta, Tel-Aviv University, "Cartesian Partial-Order Reduction"

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- 2004–2005** Ohad Shacham, Tel-Aviv University, “Improving Scalability of Model Checking using Dynamic Information” (jointly with Assaf Shuster)
- 2004–2005** Ron Elebogen, Tel-Aviv University, “Fully Automatic Verification of Absence of Errors via Interprocedural Integer Analysis” (jointly with Nurit Dor and Roberto Bagnara)
- 2003–2004** Guy Erez, Tel-Aviv University, “Generating Concrete Counter Examples for Abstract Interpreters”
- 2003–2004** Yair Sade, Tel-Aviv University, “Allocating thread-local storage in C programs”
- 2003–2004** Gilad Arnold, Tel-Aviv University, “Merging Heap Abstractions”
- 2002–2004** Boris Litvin, System and framework for Low-overhead on-line subpath profiling, Tel-Aviv University (jointly with Yossi Matias)
- 2000–2003** Roman Manevich, Tel-Aviv University, “Efficient Data Structures for Shape Analysis”
- 2000–2003** Greta Yorsh, Tel-Aviv University, “Logical Characterizations of Heap Abstractions”
- 1999–2002** David Oren, Tel-Aviv University (jointly with Yossi Matias)
- 2000–2001** Alex Warshavsky, Tel-Aviv University, “Analysing Java Components”
- 2000–2001** Michael Pan, Tel-Aviv University, “Heap Profiling for Java Programs”
- 1999–2000** Tal Lev-Ami, Tel-Aviv University, “TVLA: A System for implementing Static Analysis”
- 1999–2000** Noam Rinetsky, Technion, “Interprocedural Shape Analysis” (jointly with Orna Grumberg)
- 1998–1999** Ran Shaham, Tel-Aviv University (jointly with Elliot Kolodner) “Automatic Removal of Array Memory Leaks in Java”
- 1998–1999** Nurit Dor, Tel-Aviv University (jointly with Michael Rodeh) “Detecting Memory Errors via Static Pointer Analysis”

Patents

- 2014** “Apparatus with general numeric backtracking algorithm for solving satisfiability problems to verify functionality of circuits and software,” United States Patent 8656330
- 2001** “Method for detecting buffer overflow for computer security.” United States Patent 6301699
- 2004** “Automatic removal of array memory leaks.” United States Patent 6675379
- 1996** “Compiler and method for alias checking in a compiler.” United States Patent 5555412

Journal Editor Foundations and Trends in Programming Languages: Publish the best works in PL
Conference Program Committee Chair

- The 38-th ACM SIGACT-SIGPLAN Symposium on Programming Languages January 2011 (Program Committee Chair)
- The 18-th International Static Analysis Symposium September 2011 (General co-chair)
- The Dagstuhl Seminar “Typing, Analysis and Verification of Heap Manipulating Programs” July 2009, Schloss Dagstuhl, Germany (co-chair)
- Heap Analysis and Verification Workshop July 2008, Princeton, USA. A satellite workshop of CAV 2008 (co-chair)
- Workshop on the Verification of Concurrent Algorithms, Microsoft Research Cambridge, May 2008 (co-chair).

- Heap Analysis and Verification Workshop March 25, 2007, Braga, Portugal. A satellite workshop of ETAPS 2007 (co-chair)
- The 6th ACM International Symposium on Memory Management, ISMM 2007, Montreal, Quebec, Canada, October 21–22, 2007 ACM 2007 (chair)
- The ESOP'05 European Conference on Programming (chair)
- The Dagstuhl Seminar “Program Analysis” 12–18 April 1999, Schloss Dagstuhl, Germany (co-chair)
- The Dagstuhl Seminar “Programs with Recursively Defined Data Structures (using pointers)” 20–24 April 1998, Schloss Dagstuhl, Germany (co-chair)

Conference Program Committee

- POPL 2017, The 44th annual ACM SIGPLAN - SIGACT Symposium on Principles of Programming Languages
- The 28th International Conference on Computer Aided Verification(CAV'16)
- The 24th European Symposium on Programming (ESOP'15)
- The 27th International Conference on Computer Aided Verification(CAV'15)
- TACAS 2013, Sixteenth International Conference on Tools and Algorithms for the Construction and Analysis of Systems
- The 20th SAS 2013, Static Analysis Symposiums
- VMCAI 2012, The 13th International Conference on Verification, Model Checking, and Abstract Interpretation
- POPL 2010, The 37th annual ACM SIGPLAN - SIGACT Symposium on Principles of Programming Languages.
- CC'09, International Conference on Compiler Construction.
- TACAS 2008, Fourteenth International Conference on Tools and Algorithms for the Construction and Analysis of Systems
- APLAS 2008, 6th Asian Symposium on Programming Languages and Systems.
- IACO 2008, International Workshop on Aliasing, Confinement and Ownership.
- SAS'07, The 14th International Static Analysis Symposium
- VMCAI'05, Verification, Model Checking and Abstract Interpretation
- CAV'05, 17th Conference on Computer Aided Verification
- PLDI'06, SIGPLAN Conference on Programming Language Design and Implementation, 2006
- ACM POPL'04, Principles of Programming Languages
- SPIN'04, International SPIN Workshop on Model Checking of Software
- ACM ISMM'04, International Symposium on Memory Management
- CC'03, 10th International Conference on Compiler Construction.
- The SAS'03 Static Analysis Symposium
- SPIN'03, International SPIN Workshop on Model Checking of Software
- The ESOP'02 European Conference on Programming.

- The SAS'02 Static Analysis Symposium
- Paste'02, Program Analysis for Software Tools and Engineering (PASTE 2002)
- The ESOP'01 European Conference on Programming.
- ACM POPL'01, Principles of Programming Languages
- The CC'00 9-th International Conference on Compiler Construction.
- The SAS'99 Static Analysis Symposium
- The CC'99 8-th International Conference on Compiler Construction.
- ACM PLDI'98, SIGPLAN Conference on Programming Language Design and Implementation, 1998
- PLDI'97 SIGPLAN Conference on Programming Language Design and Implementation, 1997

Invited Speaker

- 2018** London Ethereum October 2018 meetup, “Deductive Verification Deductive Verification Deductive Verification Deductive Verification”
- 2018** Bay area Ethereum October 2018 meetup, “Deductive Verification of Smart Contracts: A tribute to the legacy of Prof. Zohar Mana
- 2018** Eighth Summer School on Formal Techniques, “Modularity for decidability Modularity for Decidability: Implementing and Semi-Automatically Verifying Distributed Systems”
- 2018** Deep Specification as part of PLDI'18, “Modularity for decidability Modularity for Decidability: Implementing and Semi-Automatically Verifying Distributed Systems”
- 2016** FSTTCS 2016 Foundations of Software Technology and Theoretical Computer Science
- 2015** Compiler and Architecture Tool Conference 2015, “Synthesizing Concurrent Data Structures”
- 2015** Haifa Verification Conference 2015, “Reasoning about Data Structure Shape: From the Heap to Distributed Systems”
- 2015** Distinguished Lecture Series, UC San Diego, “Reasoning about Data Structure Shape: From the Heap to Distributed Systems”
- 2015** ECOOP'2015, “Analyzing Networks”
- 2014** “Concurrent Data Representation Synthesis”, Distinguished lecture EPFL
- 2014** “Modular Reasoning about Heap Paths via Effectively Propositional Formulas”, Workshop on Software Correctness and Reliability, ETH Zurich
- 2013** “Data Structure Synthesis”, Strachey Lecture Oxford University
- 2012** “Checking Atomicity of Composed Collection Operations”, Invited speaker: Workshop on Software Testing and Verification, The CREST Open Workshop (COW) Program, UCL London.
- 2010** “Statically Inferring Complex Heap, Array, and Numeric invariants” Invited Conference Speaker SAS 2010: 71–99.
- 2009** “Thread Modular Shape Analysis”, Invited Conference Speaker VMCAI'09.
- 2009** “Thread Modular Shape Analysis”, Stanford Software Seminar.
- 2008** Thirty Years of Abstract Interpretation, Co-located with POPL'08
- 2007** Distinguished Lecture Series, UC Berkeley: “Shape Analysis”

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- 2005** Software Model Checking Workshop co-located with CAV: “Automatically proving properties of heap intensive imperative programs”,
- 2005** “Decision Procedures for Linked Data Structures”, Marktoberdorf Summer School 2005, an Advanced Study Institute of the NATO Science committee.
- 2005** “Shape Analysis”, The Program Analysis and Transformation Summer School Denmark
- 2005** “Shape Analysis”, Shape Analysis workshop, CVS Osaka Japan
- 2004** “On the Expressive Power of Canonical Abstraction”, Conference on Verification, Model Checking, and Abstract Interpretation
- 2004** “TVLA: A System for Generating Abstract Interpreters” Marktoberdorf Summer School 2004, an Advanced Study Institute of the NATO Science committee
- 2004** “Compile-Time Verification of Properties of Heap Intensive Programs”, UC Berkeley Distinguished Lecture Series
- 2003** “Shape Analysis”, Workshop on Infinite State Systems France. Verimag

Advisory Board

- 2006–09** Panaya Inc (Acquired by InfoSys 200M\$)
- 2018–** nCent Lab (Stanford based Venture on Blockchain)