

Curriculum Vitae: Hana Chockler

Senior Lecturer
Department of Informatics, King's College London
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Education

- 2005 Ph.D.
School of Engineering and Computer Science, Hebrew University, Jerusalem, Israel
Dissertation: *“Coverage Metrics for Model Checking”*
- 1996 Research M.Sc.
School of Computer Science, Tel-Aviv University, Tel-Aviv, Israel
Dissertation: *“Formulae with 3-bit Majority Gates”*
Supervisor: *Prof. Uri Zwick*
- 1992 B.Sc. in Computer Science and Mathematics
Hebrew University, Jerusalem, Israel

Current position

- 2017– Senior Lecturer
Department of Informatics, King's College London
- 2017– Head of the Software Systems Group
Department of Informatics, King's College London
- 2016– Editor-in-Chief, IET Software Journal

Previous positions

- 2013–2017 Lecturer
Department of Informatics, King's College London
- 2005–2013 Research Staff Member
IBM Research Laboratory, Haifa, Israel.
Projects:
RuleBase Sixth Sense (IBM hardware model-checker),
ExpliSAT (IBM software model-checker for C++),
Software design and testing
- 2004–2005 Visiting Scientist
MIT CSAIL, Cambridge, U.S.A.
- 2004–2005 Research Associate
Department of Computer Science, WPI, Worcester, U.S.A.
- 2003–2004 Research Associate
College of Computer and Information Science, Northeastern University, Boston, U.S.A.
- 1999–2003 Teaching Assistant
School of Engineering and Computer Science, Hebrew University, Jerusalem, Israel
- 1996–1999 Consultant for distributed systems design and performance, LIAM LTD, Israel
- 1994–1996 Team Lead, Telecom, Amdocs LTD, Israel

Fellowships and awards

- 2017– Royal Society International Exchanges (PI)
- 2014–2015 Google Faculty Award (PI)
- 2010–2013 Scientific and Administrative Coordinator of EU-funded collaborative project PINCETTE (Validation of Evolving Software), FP7 programme
- 2013 IBM Joint Program grant
- 2006–2008 IBM Joint Program grant
- 2000–2003 Rector excellency scholarship for Ph.D. students
- 2000–2003 Scholarship for Ph.D. students, from Israel Committee for Planning and Budgeting (VATAT)

Research supervision

- 2019– Kunxiang Jin, Ph.D. student, King’s College London
(second supervisor)
- 2017– Parvin Sadigova, Ph.D. student, King’s College London
(second supervisor)
- 2016–2020 Karine Even, Ph.D. student, King’s College London
(currently a Postdoctoral Research Associate at Imperial College London)
- 2016– Jenjira Jaimunk, Ph.D. student, King’s College London
(second supervisor)
- 2013–2017 David Landsberg, Ph.D. student, Oxford University
(currently a Postdoctoral Research Associate at UCL)
- 2014–2015 Martin Chapman, Postdoctoral Research Associate, King’s College London
(currently a Research Associate in the department)
- 2013– up to 10 M.Sc. project supervisions every year.
- 2013– up to 15 undergraduate project supervisions every year.

Teaching

- Lecturer:
- 2017–2018 Computer Science Logic, King’s College London
- 2016– Formal Verification, King’s College London
- 2014– Software Testing and Advanced Software Engineering, King’s College London
- 2014–2016 Foundations of Computing, King’s College London
- 2013–2015 Principles of Management, King’s College London

Professional activity

- 2018 PC co-Chair of Computer-Aided Verification (CAV) 2018
- 2018 Sponsorship Chair and member of the Organisation Committee of Federated Logic Conference (FLoC) 2018
- 2016– Editor-in-Chief, IET Software Journal
- 2015 Sponsorship Chair of Computer-Aided Verification (CAV) 2015
- 2012–2013 Organiser and Chair of the Validation Strategies for Software Evolution Workshop (two consecutive years)
- 2010 Publication Chair of Formal Methods in Computer-Aided Design (FMCAD) 2010
- 2008 General Chair of Haifa Verification Conference (HVC) 2008
- all years PC member of numerous conferences, including ICSE, CAV, TACAS, FASE, FMCAD, VMCAI, and others

Institutional responsibilities

- 2017– Head of the Software Systems group
- 2014– Member of the Faculty Computing Committee, representing the department
- 2013– Director of the Programme “with a year in industry” (placement year programme)

References

- Prof. Daniel Kroening, Department of Computer Science, University of Oxford, kroening@cs.ox.ac.uk , <http://www.kroening.com/>.
- Prof. Moshe Y. Vardi, Department of Computer Science, Rice University, vardi@cs.rice.edu , <https://www.cs.rice.edu/~vardi/>.
- Prof. Joseph Y. Halpern, Computer Science Department, Cornell University, halpern@cs.cornell.edu , <https://www.cs.cornell.edu/home/halpern/>.

Publications

Hana Chockler co-authored more than 60 publications in peer-reviewed conferences and journals. Her work is cited more than 1,300 times, and her *h*-index (Google scholar) is 17. Hana co-authored 10 patents and 7 published inventions.

Edited Books

1. Hana Chockler, Georg Weissenbacher(Editors). *Computer Aided Verification – 30th International Conference, CAV 2018, Held as Part of the Federated Logic Conference, FloC 2018, Oxford, UK, 2018, Proceedings, Part I*. LNCS 10981, Springer 2018.
2. Hana Chockler, Georg Weissenbacher(Editors). *Computer Aided Verification – 30th International Conference, CAV 2018, Held as Part of the Federated Logic Conference, FloC 2018, Oxford, UK, July 14-17, 2018, Proceedings, Part II*. LNCS 10982, Springer 2018.
3. Hana Chockler, Daniel Kroening, Leonardo Mariani, Natasha Sharygina (Editors). *Validation of Evolving Software*. Springer 2015.
4. Hana Chockler, Alan J. Hu (Editors). *Proceedings of Hardware and Software: Verification and Testing: 4th International Haifa Verification Conference (HVC) 2008*. Springer 2009.

Journal Publications

5. Hana Chockler, Pascal Kesseli, Daniel Kroening, and Ofer Strichman. *Learning the Language of Software Errors*. Submitted to Artificial Intelligence Journal (JAIR) after revision.
6. Roderick Bloem, Hana Chockler, Masoud Ebrahimi, Ofer Strichman. *Synthesizing Non-Vacuous Systems*. Submitted to the Journal on Formal Methods in System Design (FMSD).
7. Dalal Alrajeh, Hana Chockler, Joseph Y. Halpern. *Combining Experts' Causal Judgments*. Accepted to the Journal of Artificial Intelligence (AIJ) (extended version of the AAAI'18 paper).
8. Gadi Aleksandrowicz, Hana Chockler, Joseph Y. Halpern, and Alexander Ivrii. *The computational complexity of structure-based causality*. *Journal of Artificial Intelligence Research (JAIR)*, 58:431–451, 2017.
9. Hana Chockler, Arie Gurfinkel, Ofer Strichman. *Beyond vacuity: towards the strongest passing formula*. *Formal Methods in System Design (FMSD)* 43(3): 552-571 (2013).
10. Sara Bouchenak, Gregory Chockler, Hana Chockler, Gabriela Gheorghe, Nuno Santos, Alexander Shraer. *Verifying cloud services: present and future*. *Operating Systems Review* 47(2): 6-19 (2013).
11. Ilan Beer, Shoham Ben-David, Hana Chockler, Avigail Orni, Richard Trefer. *Explaining Counterexamples Using Causality*. *Formal Methods in System Design (FMSD)* 40(1): 20-40 (2012).

12. Hana Chockler, Daniel Kroening, Mitra Purandare. *Computing Mutation Coverage in Interpolation-based Model Checking*. IEEE TCAD 31(5): 765-778 (2012).
13. Hana Chockler, Ofer Strichman. *Before and after vacuity*, Formal Methods in System Design (FMSD) 34(1): 37-58 (2009).
14. Hana Chockler, Joseph Y. Halpern, Orna Kupferman. *What Causes a System to Satisfy a Specification?*, ACM Transactions on Computational Logic (TOCL), 9(3), 2008.
15. Hana Chockler, Orna Kupferman, Moshe Y. Vardi. *Coverage metrics for temporal logic model checking*. Formal Methods in System Design 28(3): 189-212 (2006).
16. Hana Chockler, Orna Kupferman, Moshe Y. Vardi. *Coverage Metrics for Formal Verification*. International Journal on Software Tools for Technology Transfer (STTT), Special Issue on Recent Advances in Hardware Verification, 8(4-5): 373-386 (2006).
17. Hana Chockler, Dan Gutfreund. *A lower bound for testing juntas*. Information Processing Letters 90(6): 301-305 (2004).
18. Hana Chockler, Joseph Y. Halpern. *Responsibility and blame: a structural model approach*. Journal of Artificial Intelligence Research (JAIR) 22: 93-115 (2004).
19. Hana Chockler, Orna Kupferman. *ω -regular languages are testable with a constant number of queries*. Journal of Theoretical Computer Science (TCS) 329(1-3): 71-92 (2004).
20. Hana Chockler, Uri Zwick. *Which bases admit non-trivial shrinkage of formulae?*. Journal of Computational Complexity 10(1): 28-40 (2001).

Refereed Conference Proceedings

21. Roderick Bloem, Hana Chockler, Masoud Ebrahimi, Ofer Strichman. *Synthesizing Reactive Systems Using a Robustness Specification*. Formal Methods in Computer-Aided Design Conference (FMCAD) 2019:147-151.
22. Karine Even-Mendoza, Antti E. J. Hyvärinen, Hana Chockler, Natasha Sharygina. *Lattice-based SMT for program verification*. Proceedings of MEMOCODE 2019: 16:1-16:11.
23. Hana Chockler, Shibashis Guha, Orna Kupferman. *Timed Vacuity*. FM 2018.
24. Dalal Aljareh, Hana Chockler, Joseph Y. Halpern. *Combining Experts' Causal Judgments*. AAAI 2018.
25. Sepideh Asadi, Martin Blicha, Grigory Fedyukovich, Antti E. J. Hyvärinen, Karine Even-Mendoza, Natasha Sharygina, Hana Chockler. *Function Summarization Modulo Theories*. Proceedings of LPAR 2018: 56-75.
26. Antti E. J. Hyvärinen, Matteo Marescotti, Parvin Sadigova, Hana Chockler, Natasha Sharygina. *Lookahead-Based SMT Solving*. Proceedings of LPAR 2018: 418-434.
27. Karine Even-Mendoza, Sepideh Asadi, Antti E. J. Hyvärinen, Hana Chockler, Natasha Sharygina. *Lattice-Based Refinement in Bounded Model Checking*. Proceedings of VSTTE 2018: 50-68.
28. Antti E. J. Hyvärinen, Sepideh Asadi, Karine Even-Mendoza, Grigory Fedyukovich, Hana Chockler, Natasha Sharygina. *Theory Refinement for Program Verification*. SAT 2017: 347-363.
29. Leonardo Alt, Sepideh Asadi, Hana Chockler, Karine Even-Mendoza, Grigory Fedyukovich, Antti E. J. Hyvärinen, Natasha Sharygina. *HiFrog: SMT-based Function Summarization for Software Verification*. TACAS (2) 2017: 207-213.

30. Roderick Bloem, Hana Chockler, Masoud Ebrahimi, Ofer Strichman. *Synthesizing Non-Vacuous Systems*. VMCAI 2017: 55-72.
31. David Landsberg, Hana Chockler, Daniel Kroening. *Probabilistic Fault Localisation*. Haifa Verification Conference 2016: 65-81.
32. Hana Chockler. *Causality and Responsibility for Formal Verification and Beyond* (invited paper). CREST Workshop at ETAPS 2016: 1-8.
33. Martin Chapman, Hana Chockler, Pascal Kesseli, Daniel Kroening, Ofer Strichman, Michael Tautschnig. *Learning the Language of Error*. ATVA 2015: 114-130.
34. David Landsberg, Hana Chockler, Daniel Kroening, Matt Lewis. *Evaluation of Measures for Statistical Fault Localisation and an Optimising Scheme*. FASE 2015: 115-129.
35. Hana Chockler, Norman E. Fenton, Jeroen Keppens, David A. Lagnado. *Causal analysis for attributing responsibility in legal cases*. ICAIL 2015: 33-42.
36. Gadi Aleksandrowicz, Hana Chockler, Joseph Y. Halpern, Alexander Ivrii. *The Computational Complexity of Structure-Based Causality*. AAI 2014: 974-980.
37. Hana Chockler, Giovanni Denaro, Meijia Ling, Grigory Fedukovich, Antti E. J. Hyvärinen, Leonardo Mariani, Ali Muhammad, Manuel Oriol, Ajitha Rajan, Ondrej Sery, Natasha Sharygina, Michael Tautschnig. *PINCETTE - Validating Changes and Upgrades in Networked Software*. CSMR 2013: 461-464.
38. Shoham Ben-David, Hana Chockler, Orna Kupferman. *Attention-Based Coverage Metrics*. Haifa Verification Conference 2013: 230-245.
39. Hana Chockler, Dmitry Pidan, Sitvanit Ruah. *Improving Representative Computation in ExpliSAT*. Haifa Verification Conference 2013: 359-364.
40. Hana Chockler, Karine Even, Eran Yahav. *Finding rare numerical stability errors in concurrent computations*. ISSTA 2013: 12-22.
41. Hana Chockler, Alexander Ivrii, Arie Matsliah, Simone Fulvio-Rollini, Natasha Sharygina. *Using Cross-Entropy for Satisfiability*, Proceedings of 28th ACM Symposium On Applied Computing (SAC), 2013.
42. Hana Chockler, Alexander Ivrii, Arie Matsliah. *Computing Interpolants without Proofs*, Proceedings of Haifa Verification Conference (HVC), 2012.
43. Hana Chockler, Sitvanit Ruah. *Verification of Software Changes with ExpliSAT*, Proceedings of 4th Workshop on Hot Topics in Software Upgrades (HotSWUp), 2012.
44. Hana Chockler, Alexander Ivrii, Arie Matsliah, Shiri Moran, Ziv Nevo. *Incremental Formal Verification of Hardware*, Proceedings of 11th FMCAD, 2011: 135-143.
45. Hana Chockler, Arie Gurfinkel, Ofer Strichman. *Variants of LTL Query Checking*, Proceedings of Haifa Verification Conference (HVC), 2010. LNCS, 76-92.
46. Hana Chockler, Daniel Kroening, Mitra Purandare. *Coverage in Interpolation-based Model Checking*, Proceedings of DAC, 2010: 182-187.
47. Ilan Beer, Shoham Ben-David, Hana Chockler, Avigail Orni, Richard Treffer. *Explaining Counterexamples Using Causality*, Proceedings of 21st CAV, 2009: 94-108.
48. Hana Chockler, Eitan Farchi, Benny Godlin, Sergey Novikov. *Cross-Entropy-Based Replay of Concurrent Programs*, Proceedings of FASE 2009: 201-215.

49. Hana Chockler, Alan J. Hu (editors). *Hardware and Software: Verification and Testing, 4th International Haifa Verification Conference (HVC)*, 2008. Proceedings Springer 2009.
50. Hana Chockler, Arie Gurfinkel, Ofer Strichman. *Beyond Vacuity: Towards the Strongest Passing Formula*, Proceedings of 8th FMCAD, 2008.
51. Hana Chockler, Orna Grumberg, Avi Yadgar. *Efficient Automatic STE Refinement Using Responsibility*, Proceedings of TACAS, 2008: 233–248.
52. Hana Chockler, Benny Godlin, Eitan Farchi, Sergey Novikov. *Cross-Entropy Based Testing*, Proceedings of FMCAD, 2007: 101–108.
53. Hana Chockler, Ofer Strichman. *Easier and More Informative Vacuity Checks*, Proceedings of MEMOCODE, 2007: 189–198.
54. Paul C. Attie, David H. Lorenz, Alexandra Portnova, Hana Chockler. *Behavioral Compatibility Without State Explosion: Design and Verification of a Component-Based Elevator Control System*, Proceedings of CBSE, 2006: 33–49.
55. Paul C. Attie, Hana Chockler. *Automatic Verification of Fault-Tolerant Register Emulations*. Proceedings of 7th INFINITY. ENTCS 149(1): 49–60 (2006) (volume dedicated to workshops affiliated with CONCUR 2005).
56. Hana Chockler, Kathi Fisler. *Temporal Modalities for Concisely Capturing Timing Diagrams*. Proceedings of 13th CHARME, 2005. LNCS 3725: 176–190.
57. Paul C. Attie, Hana Chockler. *Efficiently verifiable sufficient conditions for deadlock-freedom of large concurrent programs*. Proceedings of 6th VMCAI, 2005. LNCS 3385: 465–481.
58. Hana Chockler, Orna Kupferman, Moshe Y. Vardi. *Coverage Metrics for Formal Verification*. Proceedings of 12 CHARME, 2003. LNCS 2860: 111–125.
59. Hana Chockler, Joseph Y. Halpern. *Responsibility and blame: a structural model approach*. Proceedings of the 18th IJCAI, 2003. Morgan Kaufmann: 147–153.
60. Hana Chockler, Orna Kupferman. *Coverage of implementations by simulating specifications*. Proceedings of the 17th TCS, 2002. Kluwer 223: 409–421.
61. Hana Chockler, Orna Kupferman. *ω -regular languages are testable with a constant number of queries*. Proceedings of 6th RANDOM, 2002, LNCS 2483: 26–38.
62. Hana Chockler, Orna Kupferman, Robert P. Kurshan, Moshe Y. Vardi. *A practical approach to coverage in model checking*. Proceedings of 13th CAV, 2001. LNCS 2102: 66–78.
63. Hana Chockler, Uri Zwick. *Which formulae shrink under random restrictions?*. Proceedings of 12th SODA 2001, 702–708.
64. Hana Chockler, Orna Kupferman, Moshe Y. Vardi. *Coverage metrics for temporal logic model checking*. Proceedings of 7th TACAS, 2001. LNCS 2031: 528–542.

Invited presentations

1. Invited speaker in the London Judgement and Decision Making Seminar, University College London, 2018.
2. Invited speaker in the 11th International Workshop on Reachability Problems (RP), 2017.
3. Invited speaker in the Workshop on Bayesian Networks and Argumentation in Evidence Analysis (FOSW02), 2016.

4. Keynote speaker in the 1st Workshop on Causal Reasoning for Embedded and safety-critical Systems Technologies (CREST) 2016, associated with ETAPS.
5. Numerous presentations in colloquia in universities in the UK and Europe (University of Oxford, UCL, Imperial College, TU Graz, University of Lugano, etc.)

Selected Patents

1. **Hana Chockler**, Oded Margalit, Dmitry Pidan, Sitvanit Ruah. *Avoiding similar counter-examples in model-checking*. US2015074652 (A1), 12/03/2015.
2. **Hana Chockler**, Oded Margalit, Dmitry Pidan, Sitvanit Ruah. *Directing verification towards bug-prone portions*. US2015074651 (A1), US9389984 (B2), 12/03/2015.
3. **Hana Chockler**, Dmitry Pidan, Sitvanit Ruah, Karen Yorav. *Dominant-state-based coverage metric*. US2014215445 (A1), US8856755 (B2), 31/07/2014.
4. **Hana Chockler**, Sitvanit Ruah. *Validation of revised computer programs*. US2014208297 (A1), 24/07/2014.
5. **Hana Chockler**, Alexander Ivrii, Arie Matsliah, Shiri Moran, Ziv Nevo. *Incremental formal verification*, US2013060545 (A1), US8996339 (B2), 07/03/2013.
6. **Hana Chockler**, Sharon Keidar-Barner. *Concretization of abstracted traces*. US2011218794 (A1), US8903700 (B2), 08/09/2011.
7. Orna Raz, Eitan Farchi, Yochai Ben-Chaim, **Hana Chockler**, Lawrence Blount, Aviad Zlotnick. *Hierarchical aggregation system for advanced metering infrastructures*. US2011202904 (A1), US8448147 (B2), 18/08/2011.
8. Yochai Ben-Chaim, Lawrence Blount, **Hana Chockler**, Eitan Farchi, Orna Raz-Peleg, Aviad Zlotnick. *Selective Code Coverage Instrumentation*. US2010131930 (A1), 27/05/ 2010.
9. Rachel Tzoref, **Hana Chockler**, Eitan Farchi. *Using automatically generated decision trees for design and review documentation*. US2009276379 (A1), 05/11/2009.
10. **Hana Chockler**, Eitan Farchi, Benjamin Godlin. *Replay of program executions using cross-entropy*. US2009106740 (A1), US8327334 (B2), 23/04/2009.
11. **Hana Chockler**, Eitan Farchi, Benjamin Godlin, Sergey Novikov. *Using Cross-entropy to Test Executable Logic Code*. US2009106737 (A1), US8056059 (B2), 23/04/2009.
12. **Hana Chockler**, Ziv Glazberg, Benjamin Godlin, Sharon Keidar-Barner. *Model Checking of Non-Terminating Software Programs*. US2008098347 (A1), US7921411 (B2), 24/04/2008.
13. **Hana Chockler**, Eitan Farchi, Ziv Glazberg, Benjamin Godlin. *Equalizing probabilities of testing different paths in the program*. US2008052692 (A1), US7853932 (B2), 28/02/2008.