

Curriculum Vitae

Hadas Kress-Gazit

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Associate Professor

Sibley School of Mechanical and Aerospace Engineering
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RESEARCH INTERESTS

Robotics, Autonomy, Formal Methods for Robotics, Motion Planning, Task Planning, Synthesis, Verification, Hybrid Systems, Language for Robotics, Human Robot Interaction, Modular Robots, Swarm Robotics.

PROFESSIONAL EXPERIENCE

Associate Professor (July 2015 - Present)

Sibley School of Mechanical and Aerospace Engineering
Cornell University, Ithaca, NY.

Assistant Professor (Jan. 2009 - June 2015)

Sibley School of Mechanical and Aerospace Engineering
Cornell University, Ithaca, NY.

Post-Doctoral Researcher (Aug. 2008 - Dec. 2008)

GRASP Lab, University of Pennsylvania, Philadelphia, PA, USA.

Research Assistant (Sept. 2003 - Aug. 2008)

GRASP Lab, University of Pennsylvania, Philadelphia, PA, USA. Developed methods to create robot controllers that are guaranteed to satisfy high level tasks under the ARO ACCLIMATE and MURI SUBTLE grants.

Engineer (Sep. 2001 - Aug. 2003)

Missile division, RAFAEL, Israel. Designed navigation algorithms using MATLAB based tools and simulations. Wrote specifications for real-time software and integrated the navigation segment into a complete system.

Engineer (Oct. 1999 - Sep. 2001)

Chip Design group of IBM's Haifa Design Center, Israel. Developed models for design validation. Integrated verification environments, wrote and ran tests using VHDL, Formal Verification, Perl and internal IBM tools.

EDUCATION

University of Pennsylvania (August 2008), Philadelphia, PA, USA
Ph.D. in Electrical Engineering, Department of Electrical and Systems Engineering
Advisor: Prof. George J. Pappas

University of Pennsylvania (May 2005), Philadelphia, PA, USA
Master of Science in Engineering, Department of Electrical and Systems Engineering
Advisor: Prof. George J. Pappas

Technion (Jan 2002), Haifa, Israel
B.Sc Cum Laude, Department of Electrical Engineering

AWARDS & HONORS

Best Systems Paper, Finalist Best Paper and Best Student Paper - 2016 Robotics: Science and Systems

NAE US Frontiers of Engineering participant, 2014

Fiona Ip Li '78 and Donald Li '75 Excellence in teaching award, 2013

Robotics: Science and Systems Early Career Spotlight Presentation 2013 (selected by the Robotics: Science and System Board)

DARPA Young Faculty Award (2012-2014)

NSF CAREER Award (2010-2015)

Finalist - Best Paper (2007 IEEE/RSJ International Conference on Intelligent Robots and Systems)

Finalist - Best Student Paper (2007 International Conference on Robotics and Automation)

TEACHING EXPERIENCE AT CORNELL

MAE 4180/5180, CS 3758: *Autonomous Mobile Robots* (Spring 2010-2017)
Senior and graduate-level elective 4-credit course.
Enrollment: 48 (S '10), 28 (S '11), 26 (S '12), 38 (S '13), 37 (S '14), 35 (s '15), 46 (s '17)

MAE 6770: *Formal Methods for Robotics* (Fall 2014, Fall 2017)
PhD-level elective 3-credit course.
Enrollment: 15 (F '14 offered as a special topics course MAE 6950), 20 (F '17)

MAE 6740, CS 5761: *Hybrid Systems* (Spring 2009, Fall 2011)
PhD-level elective 4-credit course.
Enrollment: 20 (S '09), 18 (F '11)

MAE 3780: *Mechatronics* (Fall 2010, Fall 2013, Fall 2016, Fall 2017)
Junior-level 4-credit course, fulfills Mechanical Engineering major requirement for electrical circuits.
Enrollment: 116 (F '10), 161 (F '13), 143 (F '16), 147 (F '17)

PUBLICATIONS

Journal Publications and Book Chapters

23. J. Daudelin, G. Jing, T. Tosun, M. Yim, **H. Kress-Gazit** and M. Campbell, An Integrated System for Perception-Driven Autonomy with Modular Robots, in revision.
22. K.W. Wong, R. Ehlers and **H. Kress-Gazit**, Resilient, Provably-correct, High-level Robot Behaviors, IEEE Transactions on Robotics, under review.
21. M. Lahijanian, M. Svorenova, A. Morye, B. Yeomans, D. Rao, I. Posner, P. Newman, **H. Kress-Gazit** and M. Kwiatkowska, Resource-Performance Trade-off Analysis for Mobile Robots, Robotics and Automation Letters, under review.
20. G. Jing, T. Tosun, M. Yim and **H. Kress-Gazit**, Accomplishing High-Level Tasks with Modular Robots, Autonomous Robots, conditionally accepted.
19. K.W. Wong and **H. Kress-Gazit**, Robot Operating System (ROS) Introspective Implementation of High-Level Task Controllers, Journal of Software Engineering for Robotics (JOSER) Special Issue on the IRC2017 Conference, to appear.
18. **H. Kress-Gazit**, M. Lahijanian and V. Raman, Synthesis for Robots: Guarantees and Feedback for Robot Behavior, Annual Review of Control, Robotics, and Autonomous Systems, to appear.
17. J. Alonso-Mora, J. A. DeCastro, V. Raman, D. Rus and **H. Kress-Gazit**, Reactive Mission and Motion Planning with Deadlock Resolution Avoiding Dynamic Obstacles, Autonomous Robots, August 2017.
16. B. Johnson, F. Havlak, **H. Kress-Gazit** and M. Campbell, Experimental Evaluation and Formal Analysis of High-Level Tasks with Dynamic Obstacle Anticipation on a Full-Sized Autonomous Vehicle, Journal of Field Robotics, vol. 34, no.5, pp. 897-911, 2017.
15. J. A. DeCastro, R. Ehlers, M. Rungger, A. Balkan and **H. Kress-Gazit**, Automated Generation of Dynamics-Based Runtime Certificates for High-Level Control, Discrete Event Dynamic Systems, vol. 27, no.2, pp. 371-405, 2017.
14. A. Romay, S. Maniatopoulos, S. Kohlbrecher, P. Schillinger, A. Stumpf, **H. Kress-Gazit**, O. von Stryk, D. Conner, Collaborative Autonomy Between High-Level Behaviors and Human Supervisors for Remote Manipulation Tasks using Different Humanoid Robots, Journal of Field Robotics Special Issue on the DARPA Robotics Challenge Finals, September 2016.
13. M. Lahijanian, M. Maly, D. Fried, L. Kavraki, **H. Kress-Gazit** and M. Vardi, Iterative Temporal Planning in Uncertain Environments with Partial Satisfaction Guarantees, IEEE Transactions on Robotics, vol. 32, no.3, pp. 583 - 599, 2016.
12. B. Johnson and **H. Kress-Gazit**, Analyzing and Revising Synthesized Controllers for Robots with Sensing and Actuation Errors, International Journal of Robotics Research, vol. 34, no.6, pp. 816-832, 2015.
11. V.Raman, N. Piterman, C. Finucane, **H. Kress-Gazit**, Timing Semantics for Abstraction and Execution of Synthesized High-Level Robot Control, IEEE Transactions on Robotics, vol. 31, no.3, pp. 591-604, 2015.
10. C. Lignos, V. Raman, C. Finucane, M. Marcus and **H. Kress-Gazit**, Provably Correct Reactive Control from Natural Language, Autonomous Robots, vol. 38, no. 1, pp. 89-105, 2015.
9. J. A. DeCastro, **H. Kress-Gazit**, Synthesis of Nonlinear Continuous Controllers for Verifiably-Correct High-Level, Reactive Behaviors, International Journal of Robotics Research, International Journal of Robotics Research, vol. 34, no. 3, pp. 378-394, 2015.
8. R. Alur, R. Bodk, E. Dallal, D. Fisman, P. Garg, G. Juniwal, **H. Kress-Gazit**, P. Madhusudan, M. M. K. Martin, M. Raghothaman, S. Saha, S. A. Seshia, R. Singh, A. Solar-Lezama, E. Torlak and A. Udupa, Syntax-Guided Synthesis, Dependable Software Systems Engineering, pp. 1-25, 2015.
7. V. Raman and **H. Kress-Gazit**, Explaining Impossible High-Level Robot Behaviors, IEEE Transactions on Robotics, vol. 29, no. 1, pp. 94-104, 2013.

6. B. Johnson and **H. Kress-Gazit**, Probabilistic Guarantees for High-Level Robot Behavior in the Presence of Sensor Error, *Autonomous Robots*, vol.33, no.3, pp.309-321, 2012.
5. **H. Kress-Gazit**, T. Wongpiromsarn and U. Topcu, Correct, Reactive Robot Control from Abstraction and Temporal Logic Specifications. Special Issue of the *IEEE Robotics and Automation Magazine on Formal Methods for Robotics and Automation*, vol.18, no.3, pp.65-74, Sept. 2011.
4. **H. Kress-Gazit**, G. E. Fainekos and G. J. Pappas, Temporal Logic-based Reactive Mission and Motion Planning. *IEEE Transactions on Robotics*, vol. 25, no. 6, pp. 1370-1381, 2009.
3. G. E. Fainekos, A. Girard, **H. Kress-Gazit** and G. J. Pappas, Temporal Logic Motion Planning for Dynamic Mobile Robots. *Automatica*, vol. 45, no. 2, pp. 343-352, February 2009, Elsevier
2. **H. Kress-Gazit**, G. E. Fainekos and G. J. Pappas, Translating Structured English to Robot Controllers. Invited paper, *Advanced Robotics Special Issue on Selected Papers from IROS 2007*, vol. 22, no. 12, pp. 1343-1359, 2008.
1. **H. Kress-Gazit**, D. C. Conner, H. Choset, A. Rizzi and G. J. Pappas, Courteous cars: Decentralized multiagent traffic coordination. Special Issue of the *IEEE Robotics and Automation Magazine on Multi-Agent Robotics*, vol. 15, no. 1, pp. 30-38, 2008.

Peer-reviewed Conference Publications:

50. T. Tosun, J. Daudelin, G. Jing, **H. Kress-Gazit**, M. Campbell and M. Yim, Perception-Informed Autonomous Environment Augmentation With Modular Robots, *IEEE International Conference on Robotics and Automation*, under review.
49. S. Moarref and **H. Kress-Gazit**, Decentralized Control of Robotic Swarms from High-Level Temporal Logic Specifications, *International Symposium on Multi-Robot and Multi-Agent Systems (MRS)*, Los Angeles, CA, December 2017.
48. A. Boteanu, J. Arkin, S. Patki, T. Howard and **H. Kress-Gazit**, Robot-Initiated Specification Repair through Grounded Language Interaction, *2017 AAAI Fall Symposium on Natural Communication for Human-Robot Collaboration*, Arlington, VA, November 2017.
47. J. Arkin, M. Walter, A. Boteanu, M. Napoli, H. Biggie, **H. Kress-Gazit**, and T. Howard, Contextual Awareness: Understanding Monologic Natural Language Instructions for Autonomous Robots, *IEEE International Symposium on Robot and Human Interactive Communication, (RO-MAN)*, Lisbon, Portugal, August 2017.
46. G. Jing, T. Tosun, M. Yim and **H. Kress-Gazit**, An End-to-End System for Accomplishing Tasks with Modular Robots: Perspectives for the AI community, *International Joint Conference on Artificial Intelligence (IJCAI) 2017 - invited to "Sister Conference Best Paper Track"*, Melbourne, Australia, August 2017.
45. K.W. Wong and **H. Kress-Gazit**, From High-Level Task Specification to Robot Operating System (ROS) Implementation, *IEEE International Conference on Robotic Computing*, Taichung, Taiwan, April 2017.
44. S. Hamill, B. Peele, P. Ferenz, M. Westwater, R. Shepherd and **H. Kress-Gazit**, Gait Synthesis for Modular Soft Robots, *International Symposium on Experimental Robotics (ISER)*, Tokyo, Japan, October 2016.
43. A. Boteanu, T. Howard, J. Arkin and **H. Kress-Gazit**, A Model for Verifiable Grounding and Execution of Complex Language Instructions, *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Daejeon, Korea, October 2016.
42. K.W. Wong and **H. Kress-Gazit**, Need-based Coordination for Decentralized High-level Robot Control, *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Daejeon, Korea, October 2016.

41. G. Jing, T. Tosun, M. Yim and **H. Kress-Gazit**, An End-To-End System for Accomplishing Tasks with Modular Robots, Robotics: Science and Systems (RSS), Ann Arbor, Michigan, USA, June 2016. **Best systems paper award, finalist for best paper and best student paper awards**
40. S. Maniatopoulos, P. Schillinger, V. Pong, D. C. Conner and **H. Kress-Gazit**, Reactive High-level Behavior Synthesis for an ATLAS Humanoid Robot, IEEE International Conference on Robotics and Automation, Stockholm, Sweden, May 2016.
39. J. DeCastro and **H. Kress-Gazit**, Nonlinear Controller Synthesis and Automatic Workspace Partitioning for Reactive High-Level Behaviors, Hybrid Systems: Computation and Control (HSCC), Vienna, Austria, April 2016.
38. J. DeCastro, J. Alonso-Mora, V.i Raman, D. Rus and **H. Kress-Gazit**, Collision-Free Reactive Mission and Motion Planning for Multi-Robot Systems, International Symposium of Robotics Research (ISRR), Sestri Levante, Italy, September 2015.
37. A. Mehta, J. DelPreto, K. W. Wong, S. Hamill, **H. Kress-Gazit** and D. Rus, Robot Creation from Functional Specifications, International Symposium of Robotics Research (ISRR), Sestri Levante, Italy, September 2015.
36. T. Tosun, G. Jing, **H. Kress-Gazit** and Mark Yim, Computer-Aided Compositional Design and Verification for Modular Robots, International Symposium of Robotics Research (ISRR), Sestri Levante, Italy, September 2015.
35. J. A. DeCastro and **H. Kress-Gazit**, Dynamics-Driven Adaptive Abstraction for Reactive High-Level Mission and Motion Planning, IEEE International Conference on Robotics and Automation 2015, Seattle WA, May 2015.
34. K.W. Wong and **H. Kress-Gazit**, Let's Talk: Autonomous Conflict Resolution for Robots Carrying out Individual High-level Tasks in a Shared Workspace, IEEE International Conference on Robotics and Automation 2015, Seattle WA, May 2015.
33. K.W. Wong, R. Ehlers and **H. Kress-Gazit**, Correct High-level Robot Behavior in Environments with Unexpected Events, In the Proceedings of Robotics: Science and Systems 2014, Berkeley, CA, July 2014.
32. S. Maniatopoulos, M. Blair, C. Finucane and **H. Kress-Gazit**, Open-World Mission Specification for Reactive Robots, In the Proceedings of IEEE International Conference on Robotics and Automation 2014, Shanghai, China, May 2014.
31. V. Raman and **H. Kress-Gazit**, Synthesis for Multi-Robot Controllers with Interleaved Motion, In the Proceedings of IEEE International Conference on Robotics and Automation 2014, Shanghai, China, May 2014.
30. R. Ehlers, S. A. Seshia and **H. Kress-Gazit**, Synthesis with Identifiers, In the Proceedings of Verification, Model Checking, and Abstract Interpretation (VMCAI), pp. 415-433, San Diego, USA, January 2014.
29. V. Raman and **H. Kress-Gazit**, Towards minimal explanations of unsynthesizability for high-level robot behaviors, In the Proceedings of the 2013 IEEE/RSJ International Conference on Intelligent Robots and Systems, pp. 757-762, Tokyo, Japan, November 2013.
28. G. Jing, R. Ehlers and **H. Kress-Gazit**, Shortcut Through an Evil Door: Optimality of Correct-by-Construction Controllers in Adversarial Environments, In the Proceedings of the 2013 IEEE/RSJ International Conference on Intelligent Robots and Systems, pp. 4796-4802, Tokyo, Japan, November 2013.
27. J. A. DeCastro and **H. Kress-Gazit**, Guaranteeing Reactive High-Level Behaviors for Robots with Complex Dynamics, In the Proceedings of the 2013 IEEE/RSJ International Conference on Intelligent Robots and Systems, pp. 749-756, Tokyo, Japan, November 2013.
26. B. Johnson and **H. Kress-Gazit**, Analyzing and Revising High-Level Robot Behaviors Under Actuator Error, In the Proceedings of the 2013 IEEE/RSJ International Conference on Intelligent Robots and Systems, pp. 741-748, Tokyo, Japan, November 2013.

25. V. Raman, C. Lignos, C. Finucane, K. Lee, M. Marcus and **H. Kress-Gazit**, Sorry Dave, I'm Afraid I Can't Do That: Explaining Unachievable Robot Tasks Using Natural Language, In the Proceedings of Robotics: Science and Systems 2013, Berlin, Germany, June 2013.
24. G. Jing and **H. Kress-Gazit**, Improving the continuous execution of reactive LTL-based controllers, In the Proceedings of IEEE International Conference on Robotics and Automation, pp. 5439-5445, Karlsruhe, Germany, May 2013.
23. V. Raman, N. Piterman and **H. Kress-Gazit**, Provably Correct Continuous Control for High-Level Robot Behaviors with Actions of Arbitrary Execution Durations, In the Proceedings of IEEE International Conference on Robotics and Automation, pp. 4075-4081, Karlsruhe, Germany, May 2013.
22. M. R. Maly, M. Lahijanian, L. E. Kavraki, **H. Kress-Gazit**, M. Y. Vardi, Iterative Temporal Motion Planning for Hybrid Systems in Partially Unknown Environments, In the Proceedings of Hybrid Systems: Computation and Control (HSCC), pp. 353-362, Philadelphia, PA, USA, April 2013.
21. V. Raman, B. Xu and **H. Kress-Gazit**, Avoiding Forgetfulness: Structured English Specifications for High-Level Robot Control with Implicit Memory, In the Proceedings of the 2012 IEEE/RSJ International Conference on Intelligent Robots and Systems, pp. 1233-1238, Vilamoura, Algarve, Portugal, October 2012.
20. V. Raman, C. Finucane and **H. Kress-Gazit**, Temporal Logic-Based Mission Planning for Robots with Slow and Fast Actions, In the Proceedings of the 2012 IEEE/RSJ International Conference on Intelligent Robots and Systems, pp. 251-256, Vilamoura, Algarve, Portugal, October 2012.
19. C. Lignos, D. J. Brooks, C. Finucane, M. S. Medvedev, I. Perera, V. Raman, **H. Kress-Gazit**, M. P. Marcus, H. A. Yanco, Make it so: Continuous, flexible natural language interaction with an autonomous robot, In the Proceedings of AAAI 2012 Workshop on Grounding Language for Physical Systems, Toronto, Canada, July 2012.
18. S. Sarid, B. Xu and **H. Kress-Gazit**, Guaranteeing High-Level Behaviors while Exploring Partially Known Maps, In the Proceedings of Robotics: Science and Systems, Sydney, Australia, July 2012.
17. B. Johnson, F. Havlak, M. Campbell and **H. Kress-Gazit**, Execution and Analysis of High-Level Tasks with Dynamic Obstacle Anticipation, In the Proceedings of IEEE International Conference on Robotics and Automation, pp. 330-337, Saint Paul, Minnesota, May 2012.
16. V. Raman and **H. Kress-Gazit**, Automated Feedback For Unachievable High-Level Robot Behaviors, In the Proceedings of IEEE International Conference on Robotics and Automation, pp. 5156-5162, Saint Paul, Minnesota, May 2012.
15. C. Finucane, G. Jing and **H. Kress-Gazit**, Designing Reactive Robot Controllers with LTLMoP, Automated Action Planning for Autonomous Mobile Robots, 2011 AAAI Workshop, San Francisco, CA, August 2011.
14. S. Castro, S. Koehler and **H. Kress-Gazit**, High-Level Control of Modular Robots, In the Proceedings of the 2011 IEEE/RSJ International Conference on Intelligent Robots and Systems, pp. 3120-3125, San Francisco, CA, September 2011.
13. V. Raman and **H. Kress-Gazit**, Analyzing Unsynthesizable Specifications for High-Level Robot Behavior, In the Proceedings of Computer Aided Verification 2011, pp. 663-668, Snowbird, Utah, July 2011.
12. B. Johnson and **H. Kress-Gazit**, Probabilistic Analysis of Correctness of High-Level Robot Behavior with Sensor Error, In the Proceedings of Robotics: Science and Systems 2011, Los Angeles, CA, June 2011.
11. C. Finucane, G. Jing and **H. Kress-Gazit**, LTLMoP: Experimenting with Language, Temporal Logic and Robot Control, In the Proceedings of the 2010 IEEE/RSJ International Conference on Intelligent Robots and Systems, pp. 1988-1993, Taipei, Taiwan, October 2010.

10. D. Lee, M. McClelland, J. Schneider, T.-L. Yang, D. Gallagher, D. Shah, N. Ahmed, P. Moran, A. Nathan, **H. Kress-Gazit** and M. Campbell, Distributed, Collaborative Human-Robotic Networks for Outdoor Experiments in Search, Identify and Track, In the Proceedings of SPIE Europe Conference on Unmanned/Unattended Sensors and Sensor Networks, Toulouse, France, October 2010.
9. J. M. Allbeck and **H. Kress-Gazit**, Constraints-Based Complex Behavior in Rich Environments, In the Proceedings of the 10th International Conference on Intelligent Virtual Agents, pp. 1-14, Philadelphia, PA, September 2010.
8. **H. Kress-Gazit** and G. J. Pappas, Automatic Synthesis of Robot Controllers for Tasks with Locative Prepositions, In the Proceedings of IEEE International Conference on Robotics and Automation, pp. 3215-3220, Anchorage, Alaska, May 2010.
7. **H. Kress-Gazit**, N. Ayanian, G. J. Pappas and V. Kumar, Recycling Controllers, In the Proceedings of IEEE Conference on Automation Science and Engineering, pp. 772-777, Washington DC, August 2008.
6. **H. Kress-Gazit** and G. J. Pappas, Automatically Synthesizing a Planning and Control Subsystem for the DARPA Urban Challenge, In the Proceedings of IEEE Conference on Automation Science and Engineering, pp. 766-771, Washington DC, August 2008.
5. D. C. Conner, **H. Kress-Gazit**, H. Choset, A. Rizzi and G. J. Pappas, Valet Parking Without a Valet. In the Proceedings of the 2007 IEEE/RSJ International Conference on Intelligent Robots and Systems, pp. 572-577, San Diego, October 2007. **Finalist, Best Paper Award**
4. **H. Kress-Gazit**, G. E. Fainekos and G. J. Pappas, From Structured English to Robot Motion. In the Proceedings of the 2007 IEEE/RSJ International Conference on Intelligent Robots and Systems, pp. 2717-2722, San Diego, October 2007
3. **H. Kress-Gazit**, G. E. Fainekos and G. J. Pappas, Wheres Waldo? Sensor-Based Temporal Logic Motion Planning. In the Proceedings of the 2007 International Conference on Robotics and Automation, pp. 3116-3121, Rome, Italy, April 2007. **Finalist, Best Student Paper Award**
2. G. E. Fainekos, **H. Kress-Gazit** and G. J. Pappas, Hybrid Controllers for Path Planning: A Temporal Logic Approach. In the Proceedings of the 44th IEEE Conference on Decision and Control, pp. 4885-4890, Seville, December 2005
1. G. E. Fainekos, **H. Kress-Gazit** and G. J. Pappas, Temporal Logic Motion Planning for Mobile Robots. In the Proceedings of the International Conference on Robotics and Automation, pp. 2020-2025, Barcelona, April 2005

Technical Reports, Editorials

4. E. Abraham, **H. Kress-Gazit**, L. Natale and A. Tacchella, Computer-Assisted Engineering for Robotics and Autonomous Systems (Dagstuhl Seminar 17071), Dagstuhl Reports, Vol. 7, num. 2, pg. 48-63, Dagstuhl, Germany, 2017.
3. P. Allen, A. Ames, C. Belta, M. Campbell, G. Hager, L. Kavraki, **H. Kress-Gazit**, V. Kumar, M. Mataric, and M. Schwager. National Science Foundation Workshop on Future Directions in Cyber-Physical Systems, Robotics, and Autonomy. Technical Report. National Science Foundation, USA, 2015.
2. **H. Kress-Gazit**, Robot challenges: Toward development of verification and synthesis techniques [from the Guest Editors], Robotics and Automation Magazine, IEEE , vol.18, no.3, pp.22-23, Sept. 2011.
Note: Due to a publishing error, the byline in the printed and online versions of this article contains the wrong author names.
1. G. E. Fainekos, A. Girard, **H. Kress-Gazit** and G. J. Pappas, Temporal Logic Motion Planning for Dynamic Mobile Robots. Technical Report MS-CIS-07-02, Department of CIS, University of Pennsylvania, January 2007.

Peer-reviewed Conference Video Publications

4. G. Jing, T. Tosun, M. Yim and **H. Kress-Gazit**, An End-to-End System for Accomplishing Tasks with Modular Robots: Perspectives for the AI community, Video submission for the International Joint Conference on Artificial Intelligence (IJCAI), August 2017. **IJCAI 2017 Best Robotics Video Award winner.**
3. K.W. Wong, C. Finucane and **H. Kress-Gazit**, Provably-Correct Robot Control with LTLMoP, OMPL and ROS, In the Proceedings of IEEE/RSJ International Conference on Intelligent Robots and Systems, pp. 2073, Tokyo, Japan, November 2013.
2. G. Jing, C. Finucane, V. Raman and **H. Kress-Gazit**, Correct High-level Robot Control from Structured English, In the Proceedings of IEEE International Conference on Robotics and Automation, pp. 3543-3544, Saint Paul, Minnesota, May 2012.
1. D. J. Brooks, C. Lignos, M. S. Medvedev, I. Perera, C. Finucane, V. Raman, A. Shultz, S. McSheehy, A. Norton, **H. Kress-Gazit**, M. Marcus, H. A. Yanco, Situation Understanding Bot Through Language and Environment, In the Proceedings of ACM/IEEE International Conference on Human-Robot Interaction, pp. 419-420, Boston, MA, March 2012.

Open-source software packages

2. Linear Temporal Logic MissiOn Planner (LTLMoP). Available at: <http://ltlmop.github.io/>
1. Matlab simulator for the iRobot Create. Available at: <http://sourceforge.net/projects/createsim/>

INVITED TALKS

53. NSF CPS PI meeting - mini workshop on Formal Methods in Cyber-Physical Systems: Impact and Future Directions, November 2017
52. CS Distinguished Lecture Series, George Mason University, November 2017
51. Robotics@MIT Seminar, MIT, October 2017
50. ISAT workshop on Diverse Ways of Inferring Missions, Washington DC, October 2017
49. Maryland Robotics Seminar, University of Maryland, September 2017
48. Workshop on Heterogeneity and Diversity for Resilience in Multi-Robot Systems, in conjunction with Robotics: Science and Systems July, 2017
47. Workshop on The What without the How: Specifying Planning Problems in Robotics, in conjunction with Robotics: Science and Systems July, 2017
46. Keynote speaker - Expanding Your Horizons, Ithaca, NY, April 2016
45. Faculty spotlight - presentation to Cornell's Board of Trustees, Ithaca, NY, March 2016
44. Cornell Silicon Valley event (CSV '16), Mountain View, CA, March 2016
43. X (formerly Google X), Mountain View, CA, March 2016
42. Oxford Robotics seminar, Oxford, UK, February 2016
41. Webinar for Cornell Alumni, December 2015
40. Joint Technion Mechanical Engineering and The Technion Autonomous Systems Program seminar, Technion, July 2015
39. ABC Robotics seminar, Ben Gurion University, July 2015
38. Workshop on Abstraction and Synthesis of Correct-by-Construction Robotics Software: Reuniting Formal Methods with Model-Driven Software Engineering, in conjunction with Robotics: Science and Systems, July 2015

37. Workshop on Women in Robotics, in conjunction with Robotics: Science and Systems, July 2015
36. Workshop on Guaranteed Safety for Uncertain Robotic Systems, in conjunction with Robotics: Science and Systems, July 2014
35. Workshop on Humans and Sensing in Cyber-Physical Systems, in conjunction with Robotics: Science and Systems, July 2014
34. Invited Keynote, AAAI symposium on the intersection of robust intelligence and trust in autonomous systems, March 2014
33. Robotics Institute (RI) seminar, Carnegie Mellon University, February 2014
32. HCRI seminar, Brown University, February 2014
31. Seminar, University of Southern California, January 2014
30. MCE seminar, California Institute of Technology, January 2014
29. Keynote speaker, GRASP Industry Day, University of Pennsylvania, January 2014
28. Control seminar, University of Michigan, January 2014
27. Invited talk, Navy Research Lab, August 2013
26. DCL seminar, Georgia Institute of Technology, March 2012
25. Mechanical Engineering Seminar, University of Delaware, November 2011
24. Invited talk, Verification Day, Hebrew University, Israel, June 2011
23. Aerospace Engineering Seminar, UIUC, April 2011
22. VaCAS Graduate Seminar, Virginia Tech, March 2011
21. Anthony J. Healey Robotics Lecture Series, Naval Postgraduate School, February 2011
20. Center for Information and Systems Engineering (CISE) seminar, Boston University, January 2011
19. Invited seminar, Rice University, USA, November 2009
18. Robotics and Embedded Systems Seminar, UC Berkeley, USA, November 2009
17. Invited seminar, Willow Garage, USA, November 2009
16. AI seminar, Computer Science department, Cornell University, USA, October 2009
15. Machines and organisms seminar, Cornell University, USA, October 2009
14. Workshop on Situated Understanding of Intention, Philadelphia PA, July 2009
13. RSS workshop on Bridging the gap between high-level discrete representations and low-level continuous behaviors, Seattle WA, June 2009
12. ICRA workshop on Formal Methods in Robotics and Automation, Kobe, Japan, May 2009
11. Robotics, Controls and Mechatronics colloquium, University of Washington, USA, January 2009
10. Mechanical and Aerospace Engineering Colloquium, Cornell University, USA, April 2008
9. Computer Science Colloquium, Rensselaer Polytechnic Institute, USA, April 2008
8. Electrical, Computer, and Systems Engineering seminar, Rensselaer Polytechnic Institute, USA, April 2008
7. Autonomous Vehicles/Robots Seminar, University of Michigan, USA, March 2008
6. Aero-Astro seminar, Massachusetts Institute of Technology, USA, March 2008
5. Center for the Foundations of Robotics Talk, Robotics Institute, Carnegie Mellon University, USA, September 2007
4. Computer Science Colloquium, Technion, Israel, November 2007
3. Computer Science Colloquium, Hebrew University, Israel, November 2007
2. Computer Science Colloquium, Ben Gurion University, Israel, November 2007

1. Computer Science Colloquium, Bar Ilan University, Israel, November 2007

WORKSHOP PRESENTATIONS (no proceedings)

Dagstuhl Seminar on Software Synthesis, Germany ,April 2012

RSS 2011 Workshop on Grounding Human-Robot Dialogue for Spatial Tasks (panelist), Los Angeles, CA, July 2011

Dagstuhl Seminar on Runtime Verification, Diagnosis, Planning and Control for Autonomous Systems, Germany ,November 2010

AAAI 2010 Workshop on Bridging The Gap Between Task And Motion Planning (BTAMP), Atlanta, GA, July 2010

RSS 2009 Workshop on Bridging the Gap between high-level discrete representation and and low-level continuous behaviors, Seattle, WA, June, 2009

OUTREACH

Cornell Adult University course on Autonomous Robots, Summer 2016

Keynote speaker at Cornell's Expanding Your Horizons day, April 2016

Project component of 2012 CURIE academy: Design and supervision of a week long robotics project for high school girls, July 2012.

Lecture as part of 2011 CURIE academy.

Project component of 2010 CURIE academy: Design and supervision of a week long robotics project for high school girls, July 2010.

Recruiting weekends for women and URM - lab tours, breakfasts

Community Dinners for the Engineering Pre-freshman Summer Program

SERVICE - Professional Community

Study groups and workshops:

- Member of the Information Science and Technology (ISAT) study group advising to DARPA (2014-2017)
- Part of group that updated the National Robotics Roadmap, 2016
- Participant - DoD Workshop on Foundations of Intelligent Sensing, Action and Learning, October 2015, Philadelphia, PA.
- Participant and report writer - NSF workshop on Future directions in cyber physical systems, robotics, and autonomy, September 2015, Washington DC.

Editorial positions:

- Associate Editor IEEE Robotics and Automation Letters (6/15-6/18)
- Associate Editor IEEE Transactions on Robotics (7/14-12/17)
- Associate Editor - IEEE International Conference on Robotics and Automation (ICRA): 2012, 2014, 2015, 2017 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS): 2011, 2012
- Area Chair - Robotics: Science and Systems (RSS): 2012, 2013
- Guest Editor - IEEE Robotics and Automation Magazine (IEEE RAM) special issue on Formal Methods for Robotics, Sept 2011.

Organizational positions:

- RSS foundation board secretary and member ('17-'23)
- Workshop organizer - Minimality and Trade-offs in Automated Robot Design, in conjunction with Robotics: Science and Systems, July 2017
- Workshop organizer - Women in Robotics III, in conjunction with Robotics: Science and Systems, July 2017
- Dagstuhl workshop organizer - Computer-Assisted Engineering for Robotics and Autonomous Systems (Dagstuhl seminar 17071), Feb 2017
- Co-organizer - Northeast Robotics Colloquium (NERC), Cornell, October 2016
- Workshops chair - Robotics: Science and Systems (RSS) 2015
- Career fair chair - IEEE International Conference on Robotics and Automation (ICRA) 2015
- Workshop organizer - Workshop on Formal Methods in Robotics and Automation (in conjunction with ICRA 2009, ICRA 2010, CAV 2011, RSS 2013, RSS 2014)
- Invited session organizer: "Approaches for guaranteeing high-level robot behaviors" - IEEE International Conference on Robotics and Automation (ICRA) 2012, "Symbolic Approaches to Motion Planning and Control" - IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2011
- Workshops and Tutorials co-chair - IEEE International Conference on Robotics and Automation (ICRA) 2010

Reviewing:

- Program committee:
 - Hybrid Systems Computation and Control (HSCC) 2017
 - AAAI Integrated Systems track 2017
 - Robotics: Science and Systems (RSS) 2009, 2011, 2014, 2015
 - 5th IFAC Conference on Analysis and Design of Hybrid Systems (ADHS) 2015

- NASA Formal Methods Symposium (NFM) 2013,2014
- International Conference on Automated Planning and Scheduling (ICAPS) 2012
- ICAPS Workshop on Verification and Validation for Planning and Scheduling Systems (VVPS) 2011
- AAAI Workshop on Bridging The Gap Between Task And Motion Planning (BTAMP) 2010
- Workshops evaluation committee - 2014 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2014)
- Journals and conferences: IEEE Transactions on Robotics; IEEE Transactions on Automation Science and Engineering; IEEE Transactions on Embedded Computing Systems; International Journal of Robotics Research; Autonomous Robots; IEEE Transactions on Human-Machine Systems; IEEE International Conference on Robotics and Automation; IEEE Conference on Decision and Control; ACM/IEEE International Conference on Human-Robot Interaction; IEEE Conference on Automation Science and Engineering; IEEE/RSJ International Conference on Intelligent Robots and Systems; International Workshop on the Algorithmic Foundations of Robotics.
- NSF panelist and external reviewer (multiple programs - CISE directorate)
- External thesis reviewer: Chanyeol Yoo - Australian Centre for Field Robotics (ACFR)

SERVICE - Cornell

- Research Advisory Committee for the university (2016- Present)
- DSC group lead (2016- Present)
- Women in Science and Engineering (WiSE) co-chair (2016- Present)
- External member - ECE search committee (2016-2017)
- Graduate School's Academic Integrity Hearing Board (2016-2019)
- Search Committee chair - Design and Manufacturing (2014-2015)
- Awards committee chair (2014 - 2015)
- Undergraduate Program Committee (2011-2014)
- Search Committee - Digital Manufacturing (2011-2012)
- SiGMA faculty advisor (2010-2015)
- Academic committee (2010-2011)
- Colloquium committee (2009)

FUNDING

ONR MURI N00014-17-1-2699 (2017-2022) - “PERISCOPE: Perceptual Representations for Actions, Composition, and Verification”

PI: Hadas Kress-Gazit. Cornell Co-PIs: Mark Campbell, Kavita Bala. Subcontractors: Brown University and MIT. Award amount: \$7,500,000

NSF DCSD EAGER CMMI-1745139 (2017-2018) - “Reliable Control For Soft Robots Through Sensor Placement”

PI: Hadas Kress-Gazit, Co-PI: Robert Shepherd. Total award: \$147,746

DARPA DSO N66001-17-2-4058 (2017-2018) - “High-Level Provably-Correct Control of Robotic Swarms”

PI: Hadas Kress-Gazit. Award amount: \$250,000

DARPA Robotics Challenge AFR 03-101/CU-01 (2014-2015) - working with team ViGIR

Cornell PI: Hadas Kress-Gazit. Total Cornell award: \$118,954

NSF National Robotics Initiative IIS-1427030 (2014-2017) - “Modeling and Verification of Language-based Interaction”

PI: Mark Campbell, Co-PIs: Hadas Kress-Gazit, Nicholas Roy (MIT). Total Cornell award: \$700,000

NSF Cyber Physical Systems CNS-1329692 (2013-2017) - “High-Level Perception and Control for Autonomous Reconfigurable Modular Robots”

PI: Hadas Kress-Gazit, Co-PIs: Mark Campbell, Mark Yim (UPenn). Total Cornell award: \$600,000, Kress-Gazit: \$293,641

DARPA Young Faculty Award (2012-2014) - “Autonomous robots: Explaining failures and boosting success of high-level tasks”

PI: Hadas Kress-Gazit. Award amount: \$274,118

NSF Expeditions in Computing CCF-1139025 (2012-2017) - “Expeditions in Computer Augmented Program Engineering (EXCAPE): Harnessing Synthesis for Software Design”

PI: Rajeev Alur (UPenn), Cornell PI: Hadas Kress-Gazit. Total award: \$10,000,000 , Kress-Gazit: \$500,000

NSF CAREER Award CNS-0953365 (2010-2016) - “Formal Methods for Robotics and Automation”

PI: Hadas Kress-Gazit. Award amount:\$523,834

ARO MURI (2010-2013) - “Situation Understanding Bot Through Language and Environment”

Cornell PI: Hadas Kress-Gazit. Award amount: \$427,000

NSF Cyber Physical Systems CNS-0931686 (2009-2013) - “Tightly Integrated Perception and Planning in Intelligent Robotics”

PI: Mark Campbell, Co-PIs: Hadas Kress-Gazit, Dan Huttenlocher. Total award: \$1,473,121 , Kress-Gazit: \$558,071

Course development support for MAE 4180/5180 Autonomous Mobile Robots (2010):

- The MathWorks (joint project with Daisy Fan from Computer Science): \$40,000
- Lockheed Martin Foundation: \$29,659
- Intel: \$13,250

Cornell Affinito-Stewart research grant (2010) - “High-level Tasks for Humanoid Robots”

PI: Hadas Kress-Gazit, award amount: \$5,000

STUDENTS AND POSTDOCS

Cornell Graduate Field Memberships:

- Mechanical Engineering
- Aerospace Engineering
- Computer Science
- Electrical and Computer Engineering

Post doctoral researchers:

4. Salar Moarref (9/2016 - present)
3. Adrian Boteanu (9/2015 - 4/2017)
2. Rüdiger Ehlers (1/2013 - 8/2013)
1. Shahar Sarid (6/2011 - 6/2012)

PhD students:

10. Ji Chen - Mechanical Engineering (2017-present)
9. Thais Campos - Mechanical Engineering (2016-present)
8. Adam Pacheck - Mechanical Engineering (2016-present)
7. Scott Hamill - Mechanical Engineering (2014-present)
6. Kai-Weng (Catherine) Wong - Mechanical Engineering (2013-present)
5. Spyros Maniatopoulos - Mechanical Engineering (2012-present)
4. Gangyuan (Jim) Jing - Mechanical Engineering (2011-present)
3. Jonathan A. DeCastro - Aerospace Engineering “Guaranteeing Reactive Missions For Complex Robotic Systems” (2017)
2. Benjamin Johnson - Mechanical Engineering “Synthesis, Analysis, and Revision of Correct-By-Construction Controllers for Robots with Sensing and Actuation Errors”(2014)
1. Vasumathi Raman - Computer Science “Explaining Unsynthesizability of High-Level Robot Behaviors” (2013)

Masters student:

3. Chuanwei Wu - Mechanical Engineering (2017-present)
2. Bingxin Xu - Mechanical Engineering (2011-2012)
1. Sebastian Castro - Mechanical Engineering (2010-2011)

Member of PhD special committee (not chair):

26. Yutao Han - Mechanical Engineering
25. Vighnesh Vatsal - Mechanical Engineering
24. Kevin O’Brien - Mechanical Engineering
23. Frances Zhu - Mechanical Engineering
22. Matthew Sheen - Mechanical Engineering
21. William Thomason - Computer Science
20. Nozomi Hitomi - Mechanical Engineering

19. Ilse Van Meerbeek - Mechanical Engineering
18. Jonathan Daudelin - Mechanical Engineering
17. Jordan Chipka - Mechanical Engineering
16. Joyce Fang - Mechanical Engineering
15. Ying-Ying Tran - Math
14. Dipendra Misra - Computer Science
13. Jennifer Padgett - Electrical and Computer Engineering (2017)
12. Matthew Kelly - Mechanical Engineering (2016)
11. Daniel Lee - Mechanical Engineering (2016)
10. Rina Tse - Mechanical Engineering (2016)
9. Kevin Wyffels - Mechanical Engineering (2015)
8. Benjamin Reinhardt - Mechanical Engineering (2015)
7. Frank Havlak - Mechanical Engineering (2014)
6. Jonas Neubert - Mechanical Engineering (2014)
5. Daniel Ly - Mechanical Engineering (2013)
4. Jean-Baptiste Jeannin - Computer Science (2013)
3. Jonathan Schoenberg - Aerospace Engineering (2012)
2. Danelle Shah - Mechanical Engineering (2011)
1. Joseph Shoer - Aerospace Engineering (2011)

M.Eng and undergraduate students:

Mechanical Engineering M.Eng:

62. Corinne Kentwood (2017)
61. Alex Wadell (2017)
60. Peter Ferenz (2017)
59. Narit Tangsirivanich (2017)
58. Siva Bharadvaj (2016 - 2017)
57. Elle Carroll (2015)
56. Adam Trofa (2013)
55. Jamie Sternlicht (2013 - 2014)
54. Deng Deng (2013 - 2014)
53. Nile Koebler (2011)
52. Cameron Salzberger (2012)
51. Sebastian Castro (2010)
50. Ting-Yu (Steven) Yeh (2009-2010)
49. Chun-Wei Nien (2009)
48. Nimita Wadhwa (2009)

Mechanical Engineering undergraduates:

47. Alena Hutchinson (2017-present)
46. Jonah Okike-Hephzibah (2017-present)
45. Alex Hirst (2017)
44. Anshuman Das (2017)
43. Laura Lee (2017)
42. Martin Herrera (2017)
41. Wyatt Eberspacher (2017)
40. Edem Kokou (2017)
39. Seetha Kolli (2017)
38. Emmanuel Paulino (2017)
37. Haoyun Xu (2017)
36. Peter Ferenz (2016-2017)
35. Chelsea Sidrane (2015)
34. Corinne Lippe (2015)
33. Lauren Ransohoff (2014 - 2015)
32. Jesse Miller (2014)
31. Lisa Li (2014)
30. Abhishek Sriraman (2013 - 2015)
29. Ryan Allen (2014)
28. Sean Chen (2014)
27. Nolan Poulin - Senior design (2013)
26. Jimmy Zhu (2013)
25. Charles Wang - Senior design (2011)
24. John Mannix (2011)
23. Kai Weng (Catherine) Wong (2011-2013)
22. Gangyuan (Jim) Jing (2009-2011)
21. Matt Monaghan - Senior design (2011)
20. Cameron Salzberger -Senior design and independent research (2010-2011)
19. Sarah Koehler - Senior design and independent research (2010-2011)
18. Ethan Suttner - Senior design (2010)
17. Nabeel Bhaiwala (2010)
16. Armand Awad (2010)

Computer Science M.Eng:

15. Taru Saraswat (2017)
14. Roberto Villalba (2015)

Computer Science undergraduates:

13. Joyce Xu (2017)
12. Roberto Villalba (2011-2014)
11. Anton Gilgur (2014-2016)
10. Kent Huang (2013)
9. Zizhou Wang (2013)
8. Daniel Gallagher (2011)

Electrical and Computer Engineering M.Eng:

7. Wei (Annie) Dai (2011-2013)

Electrical and Computer Engineering undergraduates:

6. Jiahao Zhang (2017)
5. Victor Dorobantu (2015 - 2016)
4. Vitchyr Pong (2015)
3. Kevin Wang (2013 - 2014)

Applied and Engineering Physics undergraduates:

2. Kevin Chaudhari (2017)
1. Nathan Bogdanowicz (2010)

High school students:

4. Vivek Myers (Summer 2016)
3. Max Westwater (2015-2016)
2. Simone Braunstein (Summer 2014)
1. Sunita Christiansen (Summer 2012)