
KRIS HAUSER

CONTACT INFORMATION

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AFFILIATION

Associate Professor

Department of Electrical and Computer Engineering
Department of Mechanical Engineering and Materials Science
Department of Computer Science
Duke University

EDUCATION

9/03 – 6/08

Stanford University

Ph.D., Computer Science

Thesis: Motion Planning for Legged and Humanoid Robots

9/99 – 5/03

University of California at Berkeley

B.A., Computer Science

B.A., Mathematics

JOURNAL PUBLICATIONS

1. J. Luo and **K. Hauser**. Robust Trajectory Optimization Under Frictional Contact with Iterative Learning. *Autonomous Robots*, 41(6), 1447-1461, 2017. doi:10.1007/s10514-017-9629-x (Impact factor 2.066)
2. **K. Hauser**. Learning the Problem-Optimum Map: Analysis and Application to Global Optimization in Robotics. *IEEE Transaction on Robotics*, 33(1):141-152, 2017. (Impact factor 2.432)
3. **K. Hauser** and Y. Zhou. Asymptotically Optimal Planning by Feasible Kinodynamic Planning in State-Cost Space. *IEEE Transactions on Robotics*, 32(6): 1431-1443, 2016. (Impact factor 2.432)
4. N. Correll, K.E. Bekris, D. Berenson, O. Brock, A. Causo, **K. Hauser**, K. Okada, A. Rodriguez, J. M. Romano, and P. R. Wurman. Analysis and Observations from the First Amazon Picking Challenge. *IEEE Transactions on Automation Science and Engineering*, PP(99):1-17, 2016. doi: 10.1109/TASE.2016.2600527 (Impact factor 2.696)
5. D. Simshaw, A. Proia, **K. Hauser**, and M. Cummings. Regulating Healthcare Robots: Maximizing Opportunities While Minimizing Risks. *Richmond Journal of Law and Technology*, 22(3), 2016. SSRN preprint at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2739462
6. A. Proia, D. Simshaw, and **K. Hauser**. Consumer Cloud Robotics and the Fair Information Practice Principles: Recognizing the Challenges and Opportunities Ahead. *Minnesota Journal of Law, Science & Technology*, 16(1), Winter, 2015. SSRN preprint at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2466723
7. **K. Hauser**. Fast Interpolation and Time-Optimization with Contact. *International Journal of Robotics Research (IJRR)*, 33(9):1231-1250, August, 2014. doi: 10.1177/0278364914527855 (Impact factor 2.863)
8. **K. Hauser**. The Minimum Constraint Removal Problem with Three Robotics Applications. *International Journal of Robotics Research (IJRR)*, 33(1):5-17, January, 2014. doi: 10.1177/0278364913507795 (Impact factor: 2.863)

9. Y. Zhang and **K. Hauser**. Unbiased, scalable sampling of protein loop conformations from probabilistic priors. *BMC Structural Biology*, 13(Supplement 1):S9, November 8, 2013. doi:10.1186/1472-6807-13-S1-S9 (Impact factor: 2.10)
10. **K. Hauser**. Recognition, Prediction, and Planning for Assisted Teleoperation with Freeform Tasks. *Autonomous Robots*, 35(4): 241-254, August, 2013. doi:10.1007/s10514-013-9350-3. (Impact factor:1.908)
11. C. Bennett and **K. Hauser**. Artificial Intelligence Framework for Simulating Clinical Decision-Making: A Markov Decision Process Approach. *Artificial Intelligence in Medicine*, 57(1):9-19, January 2013. doi: 10.1016/j.artmed.2012.12.003. (Impact factor: 1.345)
12. **K. Hauser**. On Responsiveness, Safety, and Completeness in Real-Time Motion Planning. *Autonomous Robots*, 32(1):35-48, 2012. (Impact factor: 2.011)
13. **K. Hauser** and V. Ng-Thow-Hing. Randomized Multi-Modal Motion Planning for a Humanoid Manipulation Task. *International Journal of Robotics Research (IJRR)*, 30(6):678-698, 2011. (Impact factor: 4.095)
14. **K. Hauser** and J.-C. Latombe. Multi-Modal Motion Planning in Non-Expansive Spaces. *International Journal of Robotics Research (IJRR)*, 29(7):897-915, 2010. (Impact factor: 4.095)
15. R. B. Rusu, A. Sundaresan, B. Morisset, **K. Hauser**, M. Agrawal, J.-C. Latombe, M. Beetz. Leaving Flatland: Efficient real-time three-dimensional perception and motion planning. *International Journal of Field Robotics (IJFR)*, 26(10):841-862, 2009. (Impact factor: 3.580)
16. **K. Hauser**, T. Bretl, J.-C Latombe, K. Harada, and B. Wilcox, Motion Planning for Legged Robots in Varied Terrain. *International Journal of Robotics Research (IJRR)*, Vol. 27(11-12), pp. 1325-1349, 2008. (Impact factor: 4.095)

CONFERENCE PUBLICATIONS

1. (to appear) G. Tang and **K. Hauser**. A Data-driven Indirect Method for Nonlinear Optimal Control. *IEEE/RSJ Intl. Conference on Intelligent Robots and Systems (IROS)*, September 2017.
2. (to appear) M. Draelos, B. Keller, C. Toth, A. Kuo, **K. Hauser**, and J. Izatt. Teleoperating Robots from Arbitrary Viewpoints in Surgical Contexts. *IEEE/RSJ Intl. Conference on Intelligent Robots and Systems (IROS)*, September 2017.
3. **K. Hauser**, S. Wang, and M. Cutkosky. Efficient Equilibrium Testing under Adhesion and Anisotropy using Empirical Contact Force Models. *Robotics: Science and Systems (RSS)*, July 2017.
4. Z. Li, P. Moran, C. Dong, R. Shaw, and **K. Hauser**. Development of a Tele-Nursing Mobile Manipulator for Remote Care-giving in Quarantine Areas. *IEEE Int'l. Conf. on Robotics and Automation (ICRA)*, May 2017.
5. Z. Li and **K. Hauser**. A Study of Bidirectionally Telepresent Tele-action During Robot-Mediated Handover. *IEEE Int'l. Conf. on Robotics and Automation (ICRA)*, May 2017.
6. Z. Xie, K. Liu, and **K. Hauser**. Differential Dynamic Programming with Nonlinear Constraints. *IEEE Int'l. Conf. on Robotics and Automation (ICRA)*, May 2017.
7. Y. Zhou and **K. Hauser**. Incorporating Side-Channel Information into Convolutional Neural Networks for Robotic Tasks. *IEEE Int'l. Conf. on Robotics and Automation (ICRA)*, May 2017.
8. **K. Hauser**. Continuous Pseudoinversion of a Multivariate Function: Application to Global Redundancy Resolution. *Workshop on the Algorithmic Foundations of Robotics (WAFR)*, 2016. **Best Paper Award nominee.**
9. A. Rocchi and **K. Hauser**. A Generic Simulator for Underactuated Compliant Hands. *IEEE Int'l Conf. on Simulation, Modeling, and Programming for Autonomous Robots (SIMPAN)*, 2016.
10. A. Rocchi, B. Ames, J. Li, and **K. Hauser**. Stable Simulation of Underactuated Compliant Hands. *IEEE Int'l. Conf. on Robotics and Automation (ICRA)*, 2016.
11. O. Ramos and **K. Hauser**. Generalizations of the Capture Point to Nonlinear Center of Mass Paths and Uneven Terrain. *IEEE-RAS Int'l Conference on Humanoid Robots*, November, 2015. **Best Paper Award.**
12. Z. Li, **K. Hauser**, J. R. Roldan, D. Milutinović, and J. Rosen. A Novel Method for Quantifying Arm Motion Similarity. *IEEE Engineering in Medicine and Biology Conference (EMBC)*, August, 2015.
13. J. Luo and **K. Hauser**. Robust Trajectory Optimization Under Frictional Contact with Iterative Learning. *Robotics: Science and Systems (RSS)*, July 2015.

14. **K. Hauser**. Lazy Collision Checking in Asymptotically-Optimal Motion Planning. IEEE Int'l. Conf. on Robotics and Automation (ICRA), May 2015.
15. D. Coroian and **K. Hauser**. Learning Stroke Treatment Progression Models for an MDP Clinical Decision Support System. SIAM Intl. Conf. on Data Mining, April, 2015.
16. D. Simshaw, **K. Hauser**, N. Terry, and M. Cummings. Regulating Healthcare Robots in the Hospital and the Home: Considerations for Maximizing Opportunities and Minimizing Risks. We Robot 2015, April 2015.
17. S. Yang, T. Khot, K. Kersting, G. Kunapuli, **K. Hauser**, and S. Natarajan. Learning from Imbalanced Data in Relational Domains: A Soft Margin Approach. IEEE Intl. Conference on Data Mining (ICDM), December 2014.
18. A. Eilering, G. Franchi, and **K. Hauser**. RoboPuppet: Low-Cost, 3D Printed Miniatures for Teleoperating Full-Size Robots. IEEE/RSJ Intl. Conference on Intelligent Robots and Systems (IROS), September 2014.
19. J. Luo and **K. Hauser**. An Empirical Study of Optimal Motion Planning. IEEE/RSJ Intl. Conference on Intelligent Robots and Systems (IROS), September 2014.
20. A. Eilering, V. Yap, J. Johnson, and **K. Hauser**. Identifying Support Surfaces of Climbable Structures from 3D Point Clouds. IEEE Int'l. Conf. on Robotics and Automation, May 2014.
21. **K. Hauser**. Fast Dynamic Optimization of Robot Paths under Actuator Limits and Frictional Contact. IEEE Int'l. Conf. on Robotics and Automation (ICRA), May 2014.
22. J. Luo, Y. Zhang, **K. Hauser**, H.A. Park, M. Paldhe, C.S.G. Lee, M. Grey, M. Stilman, J.H. Oh, J. Lee, I. Kim, and P. Oh. Robust Ladder-Climbing with a Humanoid Robot with Application to the DARPA Robotics Challenge. IEEE Int'l. Conf. on Robotics and Automation (ICRA), May 2014.
23. A. Proia, D. Simshaw, and **K. Hauser**. Consumer Cloud Robotics and the Fair Information Practice Principles: The Policy Risks and Opportunities Ahead. We Robot 2014, April 2014. (25% acceptance rate)
24. **K. Hauser**. Robust Contact Generation for Robot Simulation with Unstructured Meshes. In proceedings of Int'l. Symposium on Robotics Research (ISRR), December 2013. (Also in Robotics Research, Springer Tracts in Advanced Robotics (STAR), pp 357—373, Springer, 2016.)
25. **K. Hauser**. Minimum Constraint Displacement Motion Planning. In proceedings of Robotics: Science and Systems (RSS), June 2013. (30% acceptance rate)
26. **K. Hauser**. Fast Interpolation and Time-Optimization on Implicit Contact Submanifolds. In proceedings of Robotics: Science and Systems, June 2013. (30% acceptance rate)
27. J. Johnson and **K. Hauser**. Optimal Longitudinal Control Planning with Moving Obstacles. IEEE Int'l Intelligent Vehicles Symposium, May 2013. (oral presentation, 8% acceptance rate)
28. Y. Zhang, **K. Hauser**, and J. Luo. Unbiased, Scalable Sampling of Closed Kinematic Chains. In proceedings of IEEE Int'l Conference on Robotics and Automation (ICRA), May 2013. (39% acceptance rate)
29. Y. Zhang, J. Luo, **K. Hauser**, R. Ellenberg, P. Oh, H.A. Park, M. Paldhe, and C.S.G. Lee. Motion Planning of Ladder Climbing for Humanoid Robots. In proceedings of IEEE Conf. on Technologies for Practical Robot Applications (TePRA), April 2013.
30. J. Johnson, Y. Zhang, and **K. Hauser**. Minimizing Driver Interference Under a Probabilistic Safety Constraint in Emergency Collision Avoidance Systems. In proceedings of IEEE Intelligent Transportation Systems Conference, September 2012.
31. **K. Hauser**. Recognition, Prediction, and Planning for Assisted Teleoperation with Freeform Tasks. In proceedings of Robotics: Science and Systems (RSS), July 2012. (32.9% acceptance rate)
32. **K. Hauser**. The Minimum Constraint Removal Problem with Three Robotics Applications. In proceedings of Workshop on the Algorithmic Foundations of Robotics, June 2012. (Also in Algorithmic Foundations of Robotics X, Springer Tracts in Advanced Robotics (STAR), Springer Berlin / Heidelberg, 2013)
33. Y. Zhang, J. Luo, and **K. Hauser**. Sampling-based Motion Planning with Dynamic Intermediate State Objectives: Application to Throwing. In proceedings of IEEE Int'l Conference on Robotics and Automation (ICRA), May 2012. (40% acceptance rate)
34. J. Luo and **K. Hauser**. Interactive Generation of Dynamically Feasible Robot Trajectories from Sketches Using Temporal Mimicking. In proceedings of IEEE Int'l Conference on Robotics and Automation (ICRA), May 2012. (40% acceptance rate)

35. J. Johnson and **K. Hauser**. Optimal Acceleration-Bounded Trajectory Planning in Dynamic Environments Along a Specified Path. In proceedings of IEEE Int'l Conference on Robotics and Automation (ICRA), May 2012. (40% acceptance rate)
36. E. You and **K. Hauser**. Assisted Teleoperation Strategies for Aggressively Controlling a Robot Arm with 2D Input. In proceedings of Robotics: Science and Systems (RSS), Los Angeles, USA, June 2011. (24.6% acceptance rate)
37. **K. Hauser**. Adaptive Time Stepping in Real-Time Motion Planning. In proceedings of Workshop on the Algorithmic Foundations of Robotics, Singapore, Dec. 2010. (40.3% acceptance rate) (Also published in Algorithmic Foundations of Robotics IX, Springer Tracts in Advanced Robotics (STAR), Springer Berlin / Heidelberg, vol 68, p215-230, 2010)
38. **K. Hauser**. Randomized Belief-Space Replanning in Partially-Observable Continuous Spaces. In proceedings of Workshop on the Algorithmic Foundations of Robotics, Singapore, Dec. 2010. (40.3% acceptance rate) (Also published in Algorithmic Foundations of Robotics IX, Springer Tracts in Advanced Robotics (STAR), Springer Berlin / Heidelberg, vol 68, p403-418, 2010)
39. **K. Hauser** and V. Ng-Thow-Hing. Fast Smoothing of Manipulator Trajectories using Optimal Bounded-Acceleration Shortcuts. In proceedings of IEEE Int'l Conference on Robotics and Automation (ICRA), 2010.
40. R. Jansen, **K. Hauser**, N. Chentanez, F. van der Stappen, and K. Goldberg. Surgical Retraction of Non-Uniform Deformable Layers of Tissue: 2D Robot Grasping and Path Planning. In proceedings of IEEE Intl. Conference on Intelligent Robots and Systems (IROS), 2009.
41. **K. Hauser**. A Decision-Theoretic Formalism for Belief-Optimal Reasoning. In proceedings of IEEE Performance Measurement for Intelligent Systems Workshop (PerMIS), Gaithersburg, MD, Sep. 2009.
42. N. Chentanez, R. Alterovitz, D. Richie, J. Cho, **K. Hauser**, K. Goldberg, J.R. Shewchuk, and J. O'Brien, Interactive Simulation of Surgical Needle Insertion and Steering. In proceedings of ACM SIGGRAPH, 2009.
43. **K. Hauser**, R. Alterovitz, N. Chentanez, A. Okamura, and K. Goldberg, Feedback Control for Steering Needles Through 3D Deformable Tissue Using Helical Paths. In proceedings of Robotics: Science and Systems (RSS), 2009.
44. B. Morisset, R.B. Rusu, A. Sundaresan, **K. Hauser**, M. Agrawal, J.-C. Latombe, and M. Beetz, Leaving Flatland. Toward Real-Time 3D Navigation. In proceedings of IEEE Intl. Conf. of Robotics and Automation (ICRA), 2009.
45. M. Torabi, **K. Hauser**, R. Alterovitz, V. Duindam, and K. Goldberg, Guiding Medical Needles Using Single-Point Tissue Manipulation. In proceedings of IEEE Intl. Conf. of Robotics and Automation (ICRA), 2009. **Best Medical Robotics Paper Finalist.**
46. **K. Hauser** and J.-C. Latombe, Multi-Modal Motion Planning for Non-Expansive Spaces. In the Workshop on the Algorithm Foundations of Robotics (WAFR), 2008. (Also published in Algorithmic Foundations of Robotics VIII, Springer Tracts in Advanced Robotics (STAR), Springer Berlin / Heidelberg, vol 57, p615-630, 2010)
47. V. Ng-Thowhing, E. Drumwright, **K. Hauser**, Q. Wu, and J. Wormer, Expanding Task Functionality in Established Humanoid Robots. In proceedings of IEEE Intl. Conference on Humanoid Robots, 2007.
48. **K. Hauser**, V. Ng-Thow-Hing, H. Gonzalez-Baños, Multi-Modal Motion Planning for a Humanoid Robot Manipulation Task. In proceedings of International Symposium on Robotics Research (ISRR), 2007.
49. **K. Hauser**, T. Bretl, K. Harada, and J.-C Latombe, Using Motion Primitives in Probabilistic Sample-based Planning for Humanoid Robots. In proceedings of Workshop on the Algorithmic Foundations of Robotics (WAFR), 2006. (Also published in Algorithmic Foundations of Robotics VII, Springer Tracts in Advanced Robotics (STAR), Springer Berlin / Heidelberg, vol 47, p507-522, 2008)
50. **K. Hauser**, T. Bretl, J.-C Latombe, and B. Wilcox, Motion Planning for a Six-legged Lunar Robot. In proceedings of Workshop on the Algorithmic Foundations of Robotics (WAFR), 2006. (Also published in Algorithmic Foundations of Robotics VII, Springer Tracts in Advanced Robotics (STAR), Springer Berlin / Heidelberg, vol 47, p301-316, 2008)
51. Harada, K., **Hauser, K.**, Bretl, T., Latombe, J.-C., Natural Motion Generation for Humanoid Robots. In proceedings of IEEE Intl. Conference on Intelligent Robots and Systems (IROS), 2006.

52. **K. Hauser**, T. Bretl, and J.-C Latombe, Non-Gaited Humanoid Locomotion Planning. In proceedings of IEEE Conference on Humanoid Robots, 2005.
53. **K. Hauser**, T. Bretl, and J.-C Latombe, Learning-Assisted Multi-Step Planning. In proceedings of IEEE Conference on Robotics and Automation (ICRA), 2005.
54. **K. Hauser**, C. Shen, and J.F. O'Brien, Interactive Deformation Using Modal Analysis With Constraints. In proceedings of Graphics Interface 2003, pp. 247-255.

BOOK CHAPTERS AND THESIS

1. **K. Hauser**. Adaptive locomotion on uneven terrains. In A. Goswami and P. Vadakkepat (eds), *Humanoid Robotics: A Reference*, Springer, 2017.
2. **K. Hauser** and V. Ng-Thow-Hing. Multi-Modal Motion Planning for Precision Pushing on a Humanoid Robot. In K. Harada, E. Yoshida, and K. Yokoi (eds), *Motion Planning for Humanoid Robots*, Springer, 2010.
3. **K. Hauser**, Motion Planning for Legged and Humanoid Robots. Ph.D. Thesis, Stanford University, September 2008.

OTHER PUBLICATIONS

1. Y. Zhou and **K. Hauser**. 6DOF Grasp Planning by Optimizing a Deep Learning Scoring Function. RSS 2017 Workshop on Revisiting Contact - Turning a Problem into a Solution, July 2017.
2. M. C. Aubert, A. W. Draelos, M. Draelos, Y. Feng, H. He, B. Keller, J. Li, B. Vincent, F. Wang, S. Wu, K. Zhou, T. Zhu, and **K. Hauser**. A Rapid Development Methodology for an Autonomous Warehouse Picking Robot. ICRA 2017 Warehouse Picking Automation Workshop, May 2017.
3. **K. Hauser**. Learning the Problem-Optimum Map: Analysis and Application to Global Optimization in Robotics. RSS 2016 Workshop on Robot Learning and Planning, June 2016. **Best paper award**.
4. Z. Li and **K. Hauser**. Ebolobot: Progress Toward a Tele-Nursing Robotic System for Ebola Patient Treatment. RSS 2015 Workshop on Robotics for Advance Response to Epidemics, July 2015.
5. **K. Hauser**. Rigid Body Simulation with Point Cloud Models in Klamp't. RSS 2015 Workshop on Realistic, Rapid, and Repeatable Robot Simulation, July 2015.
6. M. Poffald, Y. Zhang, and **K. Hauser**. Learning problem space metrics for motion primitive selection. IROS 2014 Workshop on Machine Learning in Planning and Control of Robot Motion, September 2014.
7. **K. Hauser** and Y. Zhang. Planning-Aided Robot Design: Unified Optimization of Form, Physics, and Motion. ICRA 2014 Workshop on Task-Based Optimal Design of Robots, Hong Kong, May 2014.
8. G. Franchi and **K. Hauser**. Use of Hybrid Systems to model the RobotiQ Adaptive Gripper. Indiana University Computer Science Technical Report TR711, February 2014.
9. **K. Hauser**. Large Motion Libraries: Toward a "Google" for Robot Motions. In RSS Workshop on Robotics Challenges and Vision. Berlin, Germany, June 2013. **Best Paper Award**.
10. J. Johnson and **K. Hauser**. Optimal Longitudinal Control Planning with Moving Obstacles. In ICRA 2013 Workshop on Vehicle Autonomy for Urban Transportation Systems. Karlsruhe, Germany, May 2013.
11. Y. Zhang, J. Luo, and **K. Hauser**. Planner-aided Design of Ladder Climbing Capabilities for a DARPA Robotics Challenge Humanoid. In ICRA 2013 Workshop on Progress and Open Problems in Motion Planning and Navigation for Humanoids. Karlsruhe, Germany, May 2013.
12. Y. Zhang and **K. Hauser**. Unbiased, Scalable Sampling of Constrained Kinematic Loops. In BIBM 2012 Computational Structural Biology Workshop. October, 2012.
13. **K. Hauser**. Cutting Through the Clutter: Identifying Minimally Disturbed Subsets. In the RSS Workshop on Manipulation in Clutter: Manipulation, Perception, and Navigation in Human Environments. July, 2012.
14. C. C. Bennet and **K. Hauser**. Artificial Intelligence Framework for Simulating Cognition in Clinical Decision-Making: A Markov Decision Process Multi-Agent System. In Midwest Cognitive Science Conference, May 2012.
15. **K. Hauser**. Design of Optimal Robot User Interfaces. In IROS 2011 Workshop on Open Problems in Motion Planning, September 2011.

16. J. Johnson, Y. Zhang, and **K. Hauser**. Semiautonomous Longitudinal Collision Avoidance Using a Probabilistic Decision Threshold. In IROS 2011 Workshop on Perception and Navigation for Autonomous Vehicles in Human Environments, September, 2011.
17. **K. Hauser**. Online Planning in Continuous POMDPs with Open-Loop Information-Gathering Plans. In ICML Workshop on Planning and Acting with Uncertain Models, July 2011.
18. Y. Zhang and **K. Hauser**. Driver Interference and Risk in Semiautonomous Braking Under Uncertainty. In Intl. Workshop on Collaborative Robots and Human Robot Interaction, Philadelphia, USA, May 2011.
19. **K. Hauser**. Task Planning with Continuous Actions and Nondeterministic Motion Planning Queries. In proceedings of AAAI Workshop on Bridging the Gap between Task and Motion Planning, Atlanta, USA, July 11, 2010.
20. N. Chentanez, R. Alterovitz, D. Ritchie, L. Cho, **K. K. Hauser**, K. Goldberg, J. R. Shewchuk, and J. F. O'Brien. Simulation of Needle Insertion and Tissue Deformation for Modeling Prostate Brachytherapy. Brachytherapy, 9(Supplement 1):S72–S73, 2010. Abstracts of the 31st Annual Meeting of the American Brachytherapy Society, April 29-May 1, 2010.
21. **K. Hauser**. On the Connectivity of Motion Spaces for Biologically-Inspired Legged Robots. In proceedings of IROS 2009 Workshop on Biologically-Inspired Robots, October, 2009.
22. **K. Hauser** and J.-C. Latombe. Integrating Task and PRM Motion Planning: Dealing with Many Infeasible Motion Planning Queries. In proceedings of ICAPS 2009 Workshop on Bridging the Gap Between Task and Motion Planning, Thessaloniki, Greece, Sep. 2009.
23. C. Shen, **K. Hauser**, C. Gatchalian, and J.F. O'Brien, Modal Analysis for Real-Time Viscoelastic Deformation. Technical Sketch. ACM SIGGRAPH 2002 Conference Abstracts and Applications.

PATENTS

1. (pending) M. Draelos, K. Hauser, B. Keller, A. Kuo, and J. Izatt. “Systems and Methods for Arbitrary Viewpoint of Robotic Manipulation Robotic Surgical Assistance” International Patent Appl. No. PCT/US2016/51360, filed Sep 12, 2016
2. (pending) M. Draelos, K. Hauser, B. Keller, A. Kuo, and J. Izatt. “Cooperative Robotic Surgical Assistant and Methods of Using Same”. U.S. Provisional Patent Appl. No. 62/366,254 filed Jul 25, 2016
3. (pending) C. Bennett and K. Hauser. “Clinical decision-making artificial intelligence object oriented system and method”. US Provisional Patent Appl. No. 61/844,187, filed Jun 9, 2013
4. K. Hauser and V. Ng-Thow-Hing. “Multi-modal push planner for humanoid robots.” U.S. Patent 8,116,908. issued Feb 14, 2012

AWARDS

- Best paper award, IEEE Humanoids 2015
- NSF CAREER Award, 2013
- Indiana University Women in Computing Inspirational Teacher Award, 2011
- Siebel Scholar Fellowship, 2007 – 2008
- Thomas V. Jones Stanford Graduate Fellowship, 2003 – 2007

POSITIONS HELD

- 9/14 – **Associate Professor**. Department of Electrical and Computer Engineering, Department of Mechanical Engineering and Materials Science, Duke University
- 8/09 – 8/14 **Assistant Professor**. Department of Computer Science and Informatics, Indiana University
- 8/08 – 6/09 **Postdoctoral Fellow**. IEOR Department, University of California at Berkeley
- 6/08 – 8/08 **Postdoctoral Researcher**. Honda Research Institute of America
- 1/04 – 6/08 **Research Assistant**. Department of Computer Science, Stanford University
- 1/07 – 9/07 **Researcher**. Honda Research Institute of America
- 6/06 – 9/06 **Intern**. Honda Research Institute of America
- 6/03 – 8/03 **Intern**. Sony Computer Entertainment of America R&D
- 6/02 – 8/02 **Intern**. Sony Computer Entertainment of America R&D
- 2/02 – 5/03 **Research Assistant**. EECS Department, University of California at Berkeley

TEACHING

Spring 2017	CS 270: <i>Introduction to Artificial Intelligence</i> , Duke University
Fall 2016	ECE 384/MEMS442: <i>Introduction to Robotics and Automation</i> , Duke University
Spring 2016	ECE 490.02/MEMS555.06: <i>Advanced Robotic System Design</i> , Duke University
Fall 2015	ECE 384/MEMS442: <i>Introduction to Robotics and Automation</i> , Duke University
Spring 2015	ECE 590.04: <i>Robot Perception, Planning, and Control</i> , Duke University
Spring 2014	INFO I400/I590, CS B659: <i>Intelligent Robotics</i> , Indiana University
Fall 2013	CS B351/COGS Q351: <i>Introduction to Artificial Intelligence and Computer Simulation</i> , Indiana University
Spring 2013	CS B659: <i>Intelligent Robotics</i> , Indiana University
Fall 2012	CS B551: <i>Elements of Artificial Intelligence</i> , Indiana University
Spring 2012	CS B553: <i>Optimization and Learning Algorithms</i> , Indiana University
Fall 2011	CS B551: <i>Elements of Artificial Intelligence</i> , Indiana University
Spring 2010	CS B659: <i>Principles of Intelligent Robot Motion</i> , Indiana University
Fall 2010	CS B351/COGS Q351: <i>Introduction to Artificial Intelligence and Computer Simulation</i> , Indiana University
Spring 2009	CS B659: <i>Principles of Intelligent Robot Motion</i> , Indiana University
Fall 2009	CS B551: <i>Elements of Artificial Intelligence</i> , Indiana University
Fall 2007	Course Assistant. <i>Motion Planning</i> , Stanford University
Spring 2007	Course Assistant. <i>Motion Planning for Robots, Digital Actors, and Other Moving Objects</i> , Stanford University
Winter 2007	Course Assistant. <i>Introduction to Artificial Intelligence</i> , Stanford University
2001-2002	Reader. <i>Introduction to Computer Graphics</i> , University of California at Berkeley

GRANTS

- *Image-Guided Robotic Assist Device for Corneal Transplantation* (Co-PI). Coulter Foundation (Izatt/Hauser/Kuo). Award amount: \$227,580. 09/01/2016-8/31/2017.
- *Hands on R&D Experience in Advanced Intelligent Robotics in a Design Course Based on the Amazon Picking Challenge* (PI). Lord Foundation of North Carolina. Award amount: \$22,000. 7/1/2016-10/1/2016.
- *Modeling Intent Communication Pathways for Human-Autonomous System Collaboration* (Co-PI). NSF EAGER CMMI program (Cummings/Hauser). Award amount: \$299,990. 09/01/2015-8/31/2017.
- *NRI: Collaborative Research: Versatile Locomotion: from Walking to Dexterous Climbing with a Human-Scale Robot* (PI). NSF National Robotics Initiative program. Duke award amount: \$472,712 (total: \$1,377,580). 9/1/2015-8/31/2018.
- *RAPID: Tele-Nursing Robots for Remote Treatment of Ebola Patients* (PI). NSF RAPID program. Award amount: \$73,025. 12/1/2014-11/30/2015.
- *Cloud-Based Perception and Control of Sensor Nets and Robot Swarms* (Co-PI). AFOSR Dynamic Data-Driven Applications Systems program (Fox/Hauser/Crandall). Award amount: \$400,000. 10/1/2013-9/30/2015.
- *SCH: EXP: Intelligent Clinical Decision Support with Probabilistic and Temporal EHR Modeling* (PI). NSF Smart and Connected Health program (Hauser/Natarajan/Grannis). Award amount: \$686,411. 3/1/2014-2/8/2017.
- *Cooperative Motion Planning for Human-Operated Robots* (PI). NSF CAREER program. Award amount: \$481,151. 8/1/2013-7/31/2018.
- *Intelligent User Interfaces for Robotic Manipulation* (PI). Indiana University Faculty Research Support Program. Award amount: \$50,000. 1/1/2013-12/31/2013.
- *DRC-Hubo - Leveraging a 7-Hubo Infrastructure and Unified Algorithmic Framework for the DARPA Robotics Challenge* (Co-PI, Lead: Drexel U). DARPA Robotics Challenge program. Award amount: \$130,000 (IU portion, Phase I). 10/1/2012-1/13/2014.
- *RI: Small: Discovery and Reuse of Domain Knowledge in Large Motion Planning Systems* (PI). NSF Robust Intelligence program. Award amount: \$381,168. 8/1/2012-7/31/2015.
- *Semiautonomous Decision-Making in Vehicle Emergency Safety Systems* (PI). Indiana University Collaborative Research Grant Program. Award amount: \$36,592. 3/1/2011-2/29/2012.

PROFESSIONAL ACTIVITIES

- Program Co-Chair (Americas Region), IEEE International Conference on Humanoid Robots, 2015.
- Editor, IEEE International Conference on Robotics and Automation, 2017-
- Area Chair, Robotics Science and Systems Conference, 2014-2015
- Associate Editor, IEEE Transactions on Robotics, 2017-
- Associate Editor, IEEE International Conference on Robotics and Automation, 2011-2016
- Associate Editor, IEEE/RSJ International Conference on Intelligent Robots and Systems, 2011-2013,2015
- Associate Editor, IEEE Intelligent Vehicles Symposium, 2014
- Co-Chair, IEEE/RAS Technical Committee on Algorithms for Planning and Control of Robot Motion, 2009-2012
- Program Committee, Conference on Robot Learning (CoRL) 2017
- Program Committee, Workshop on the Algorithmic Foundations of Robotics (WAFR) 2016
- Program Committee, Int'l Symposium on Experimental Robotics (ISER) 2016
- Program Committee, International Conference on Automated Planning and Scheduling Robotics Track, 2014
- Program Committee, AAAI, 2012-2014
- Program Committee, Robotics: Science and Systems Conference, 2009-2013,2017
- Program Committee, International Workshop on Collaborative Robots and Human Robot Interaction, 2013
- Program Committee, International Conference on Development and Learning, 2010
- Organizer, ICRA Warehouse Picking Automation Workshop, 2017
- Organizer, IROS Robotic Grasping and Manipulation Competition, 2016
- Organizer, AAAI Fall Symposium on Artificial Intelligence in Human-Robot Interaction (AI-HRI), November 2014, 2015
- Organizer, HRI Workshop on Algorithmic Human-Robot Interaction (AHRI), March 2014
- Organizer, RSS Workshop on Combined Robot Motion Planning and AI Planning for Practical Applications, June 2013
- Organizer, ICRA Workshop on Combining Task and Motion Planning (TAMP), May 2013
- Organizer, ICRA Workshop on Manipulation Under Uncertainty, May 2011
- Organizer, ICRA Workshop on Mobile Manipulation, May 2010
- Organizer, RSS Workshop on Motion Planning: From Theory to Practice, June 2010
- Member, IEEE, 2008-
- Member, IEEE Robotics and Automation Society (RAS), 2009-
- Member, IEEE/RAS Technical Committee on Mobile Manipulation, 2010-
- Member, IEEE/RAS Technical Committee on Algorithms for Planning and Control of Robot Motion, 2009-
- Member, IEEE/RAS Workshop Oversight Committee, 2015-
- Reviewer, ACM CHI Conference; International Joint Conference on Artificial Intelligence; International Journal of Robotics Research; IEEE Transactions on Automation Science and Engineering; IEEE Transactions on Biomedical Engineering; IEEE Transactions on Biomechanics; IEEE Transactions on Mechatronics; IEEE Transactions on Robotics; Artificial Intelligence for Engineering Design, Analysis and Manufacturing; International Conference on Advances in Computer-Human Interaction; IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS); IEEE International Conference on Robotics and Automation (ICRA), IEEE International Conference on Humanoid Robots; Workshop on Algorithmic Foundations of Robotics (WAFR)

INVITED TALKS AND PANELS

1. **Invited Talk**, *Can we quantify the hardness of learning manipulation?* RSS 2017 Workshop on (Empirically) Data-Driven Manipulation, July 16, 2017.
2. **Invited Talk**, *Beyond Geometric Path Planning: Paradigms and Algorithms for Modern Robotics*. Robotics Institute Seminar, Carnegie Mellon University, Pittsburg PA, February 3, 2017.
3. **Invited Talk**, *Beyond Geometric Path Planning: Paradigms and Algorithms for Modern Robotics*. Institute for Robotics and Intelligent Machines Seminar, Georgia Tech, Atlanta GA, September 28, 2016.
4. **Invited Talk**, *Cooperative motion planning for human-operated robots*, RSS 2016 Workshop on Planning for Human Robot Interaction, Ann Arbor MI, June 18, 2016.

5. **Invited Talk**, *The nuances of hybrid structure in task and motion planning*, RSS 2016 Workshop on Task and Motion Planning, Ann Arbor MI, June 19, 2016.
6. **Invited Talk**, *Reliable Physics Simulation of Underactuated Compliant Hands for Manipulation Skill Learning*, RSS 2016 Workshop on Bootstrapping Manipulation Skills, Ann Arbor MI, June 19, 2016.
7. **Invited Talk**, *Robust Trajectory Optimization Under Frictional Contact with Iterative Learning*, ICRA 2016 Workshop on Robust Optimization-based Control and Planning for Legged Robots, May 16, 2016.
8. **Invited Talk**, *Motion Planning for Real World Robots*, Massachusetts Institute of Technology, Boston MA, March 1, 2016.
9. **NSF Panelist**, CISE Division, 2012-2013, 2015-2016.
10. **Invited Talk**, *Motion Planning for Real-World Robots*, Ewha Women's University, Seoul, Korea, November 6, 2015.
11. **Invited Talk**, *Motion Planning for Real-World Robots*, Robotics Jam Session, Italian Institute of Technology, Pisa, Italy, July 21, 2015.
12. **Invited Talk**, *Planning for Manipulation and Locomotion is Unified. Why not control?* RSS 2015 Workshop on Unifying Whole-Body and Manipulation Control, Rome, Italy, July 17, 2015.
13. **Invited Talk**, *Performance Bottlenecks for Optimal Motion Planning*. ICRA 2015 Workshop on Optimal Robot Motion Planning, Seattle WA, May 30, 2015.
14. **Invited Talk**, *Exploiting Task and Constraint Structure in Motion Planning*. ICRA 2015 Workshop on Beyond Geometric Constraints: Planning for Solving Complex Tasks, Reducing Uncertainty, and Generating Informative Paths & Policies, Seattle WA, May 30, 2015.
15. **Invited Talk**, *Motion Planning for Real-World Robots*, GRASP Seminar Series, University of Pennsylvania, Nov 14, 2014
16. **Invited Talk**, *Practical Robot Motion Planning*, New Faculty Lecture Series, Duke University, Nov 12, 2014.
17. **Invited Talk**, *Robust Contact Generation for Robot Simulation with Unstructured Meshes*, Institute for Human and Machine Cognition, Pensacola, FL, Oct 1, 2014.
18. **Invited Talk**, *Cooperative Motion Planning for Safe Human-Controlled Robots*, IROS 2014 Workshop on Constraint-Based Motion Generation, Chicago, IL, September 18, 2014.
19. **Invited Talk** (with Drew Simshaw), *Cloud Robotics, Data Security and Privacy*. Santa Clara American Bar Association, Silicon Valley Law Group, San Jose, CA, August 27, 2014.
20. **Invited Talk**, *Team DRC-Hubo: a DRC Trials Postmortem*. RSS Workshop on the DARPA Robotics Challenge, July 12, 2014.
21. **Invited Talk**, *Healthcare in the Age of Intelligent Machines*. Cook Medical Executive Luncheon, February 12, 2014.
22. **Invited Talk**, *User Intent Identification for Intelligent Robot Teleoperation via Hybrid Time Series Modeling*. Statistics Seminar, Indiana University, September 9, 2013.
23. **Invited Talk**, *Robot Motion Planning for Unstructured, Dynamic, and Human Environments*. ITEE Research Seminar, University of Queensland School of Information Technology and Electrical Engineering, July 20, 2012.
24. **Invited Talk**, *Automatic Crash Prevention in the Dynamic, Uncertain Driving Environment*. Delphi Electronics & Safety, Kokomo, IN, June 6, 2012.
25. **Invited Talk**, *Robot Motion Planning for Unstructured, Dynamic, and Human Environments*. Electrical Engineering Department Colloquium, University of California at Riverside, May 7, 2012.
26. **Invited Talk**, *Automatic Crash Prevention in the Dynamic, Uncertain Driving Environment*. Transportation Active Safety Institute, Indiana University / Purdue University at Indianapolis, April 20, 2012.
27. **Invited Talk**, *Robotics at Indiana University: Algorithms for Robot Planning and Control*. Rose-Hulman Institute of Technology, December 9, 2011.
28. **Invited Talk**, *Probabilistically Complete Motion Planning for Problems with Discrete Tasks, Hybrid Dynamics, and Real-Time Constraints*. Center for the Foundations of Robotics, Carnegie Mellon University, December 6, 2011.
29. **Invited Talk**, *Motion Planning for Dynamic Human-Robot Systems*. Graduate Seminar, Computer Science Department, University of North Carolina at Charlotte, December 2, 2011.
30. **Invited Talk**, *Motion Planning for Dynamic Human-Robot Systems*. Graduate Seminar, Computer Science Department, University of North Carolina at Chapel Hill, December 1, 2011.
31. **Invited Talk**, *Motion Planning for Dynamic Human-Robot Systems*. Distributed Intelligence Laboratory, University of Tennessee at Knoxville, November 30, 2011.

32. **Invited Talk**, *Real-Time Motion Planning for Dynamic Human-Robot Systems*. Computer Science Department Seminar, Indiana University / Purdue University at Indianapolis, September 2011.
33. **Panelist**. Intl. Workshop on Collaborative Robots and Human-Robot Interaction. Philadelphia, USA, May 2011.
34. **Panelist**, *Symposium on Animal Cognition*. Center for Integrative Study of Animal Behavior, Indiana University, April 2011.
35. **Invited Talk**, *Motion Planning and Control: Handling Contacts, Symbolic Tasks, and Uncertainty*. Transportation Active Safety Institute, Indiana University / Purdue University at Indianapolis, October 2010.
36. **Invited Talk**, *Motion Planning: Overcoming the Limits of Uncertainty*. Robotics and Embedded Systems Lab, University of Southern California, August 2010.
37. **Invited Talk**, *Motion Planning for Robotic and Biological Systems: Handling Contacts, Symbolic Tasks, and Uncertainty*. PRECISE Lab, Purdue University, August 2010.
38. **Invited Talk**, *Algorithmic Challenges in Assistive Robotic Manipulation*. Robotics Seminar, University of Illinois at Urbana Champaign, April 2010.
39. **Invited Talk**, *The Motion Space Complexity Hypothesis and its effects on planning, control, and learning*. Cognitive Lunch, Indiana University, November 2009.
40. **Invited Talk**, *Belief-Optimal Reasoning for Cyber-Physical Systems*. Palo Alto Research Center (PARC), Palo Alto, CA, July 2009.
41. **Invited Talk**, *Theory, Practice, and Principles for Probabilistic Roadmap Motion Planning*. Willow Garage, Menlo Park, CA, July 2009.
42. **Invited Talk**, *Feedback Control for Steering Needles in 3D Deformable Tissue*. Workshop on Advanced Sensing and Sensor Integration in Medical Robotics, IEEE Intl. Conf on Robotics and Automation (ICRA), Kobe, Japan, May 2009.
43. **Invited Talk**, *Robots in Surgery: Steerable Needles and Motion Planning*. Robotics Seminar, UC Berkeley, CA, April 2009.
44. **Invited Presenter**, *Numerical Methods in Motion Planning for Legged Robots*. Intl. Conference on Applications of Computer Algebra, Rochester, MI, July 2007.

STUDENT MENTORING

Jingru Luo (CS PhD 2015). Now at Bosch R&D.
 Yajia Zhang (CS MS, 2011, CS PhD 2015). Now at Bosch R&D.
 Erkang You (CS MS, 2011). Now at Facebook.
 Jeffrey Kane Johnson (CS MS, 2011). Now at Apple.
 Yilun Zhou (ECE/CS BS, 2017). Now at MIT.
 Carrina Dong (ME BS, 2016). Now at SpaceX.
 Marion Matthews (ME BS, 2016). Now at Google.
 Anna Eilering (CS BS, 2014). Now at Google.
 Jordan Tritell (CS BS, 2014). Now at Oculus VR.
 Miles Aubert (Expected ME PhD 2019)
 Adam Konneker (Expected ECE PhD 2018)
 Gao Tang (Expected ME PhD 2020)
 Fan Wang (Expected ME PhD 2020)
 Shihao Wang (Expected ME PhD 2020)
 Yifan Zhu (Expected ME PhD 2021)