

Tucker Ryer Hermans

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Education

- Georgia Institute of Technology, School of Interactive Computing** *Atlanta, GA*
Ph.D. Robotics, May 2014
› Thesis: “Representing and Learning Affordance-Based Behaviors”
› Thesis Committee: Aaron Bobick (**advisor**), James M. Rehg (**co-advisor**), Henrik Christensen, Charles C. Kemp, Mike Stilman, and Dieter Fox (University of Washington)
- Georgia Institute of Technology, College of Computing** *Atlanta, GA*
M.S. Computer Science: Computational Perception and Robotics, Aug 2012
- Bowdoin College** *Brunswick, ME*
A.B. Magna Cum Laude in Computer Science (Honors) and German, May 2009
- Humboldt Universität zu Berlin** *Berlin, Germany*
Coursework in Computer Science and German Literature, 2007–2008

Experience

- School of Computing, University of Utah** *July 2015–Present*
Assistant Professor
- Department of Mechanical Engineering, University of Utah** *January 2016–Present*
Adjunct Assistant Professor
- Technische Universität Darmstadt, Department of Computer Science** *April 2014–July 2015*
Postdoctoral Researcher in Robot Learning
- Georgia Institute of Technology, School of Interactive Computing** *Aug 2009–April 2014*
Graduate Research Assistant
- Georgia Institute of Technology, School of Interactive Computing** *Fall 2011*
Graduate Teaching Assistant: CS 4495 Computer Vision

Awards and Honors

- ICRA Best Medical Robotics Paper *2017*
- ICDL-Epirob CIS Student Travel Grant *2013*
- Georgia Tech President’s Fellowship *2009–2013*
- Phi Beta Kappa, Alpha of Maine *2009*
- Maine State Police Colonel’s Award *2009*
- RoboCup Standard Platform League: Second Place *2009*
- RoboCup Standard Platform League: Third Place *2008*
- RoboCup Standard Platform League: World Champion *2007*
- Sarah and James Bowdoin Scholar *2006, 2007*

Invited Talks

- Invited Talk: “Planning Multi-fingered Grasps in Learned Neural Networks”** *April 2018*
RSS 2018 Symposium, Cornell University
- Invited Talk: “Learning and Planning for Autonomous, Multi-fingered Robot Manipulation”** *October 2017*
Robotics Colloquium, University of Washington
- Invited Talk: “Within-Hand Manipulation: Object Reposing Benchmark”** *September 2017*
Workshop on Development of Benchmarking Protocols for Robot Manipulation
- Invited Talk: “Visual and Tactile Learning for Robot Manipulation”** *January 2016*
Department of Mechanical Engineering, Brigham Young University

Invited Talk: “Visual and Tactile Learning for Robot Manipulation” *April 2015*
 School of Computing, University of Utah

Invited Talk: “Visual and Tactile Learning for Robot Manipulation” *March 2015*
 School of Computer Science, McGill University

Invited Talk: “Visual and Tactile Learning for Robot Manipulation” *February 2015*
 Department of Computer Science, Drexel University

Invited talk: “Tactile Sensing for Object Manipulation in Clutter” *September 2014*
 Third Workshop on Robotics in Clutter, IROS 2014

Academic Service: External

Conference on Robot Learning (CoRL) *2018*
 Area Chair

Robotics: Science and Systems (RSS) *2018*
 Area Chair

International Journal of Robotics Research: Special Issue on RSS 2017 *2017*
 Guest Editor

Robotics: Science and Systems (RSS) *2017*
 Presentation Chair

National Science Foundation *2017, 2018*
 Panel Reviewer

IEEE International Conference on Robotics and Automation (ICRA) *2017, 2018*
 Associate Editor

IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) *2016, 2017*
 Associate Editor

U.S. Army Medical Research and Materiel Command, Congressionally Directed Medical Research Programs (CDMRP) *2016*
 Panel Reviewer

Workshop on “Visual and Tactile Learning for Interaction” at Robotics: Science and Systems *July 2015*
 Lead Organizer

Program Committee Member:

Robotics: Science and Systems (RSS) (2018), Conference on Robot Learning (CoRL) (2018), AAMAS Robotics Track (2017), ECCV Workshop on Affordances (2014), RSS Workshop on Affordances (2014), IROS Workshop on Cognitive Robotics and Systems (2013), RSS Workshop on Robots in Clutter (2013), ICRA Workshop on Interactive Perception (2013), RoboCup Symposium (2010, 2011)

Reviewer:

International Journal of Robotics Research, IEEE Transactions on Robotics, Autonomous Robots, IEEE Robotics and Automation Letters, IEEE Transactions on Cognitive and Developmental Systems, IROS, ICRA, Humanoids, Conference on Robot Learning (CoRL), International Symposium on Robotics Research (ISRR), Journal of Intelligent and Robotic Systems, NIPS 2014 Workshop: Autonomously Learning Robots, Human Robot Interaction: Workshops and Tutorials

Academic Service: Outreach

Outreach Lecture: “AlphaGo: In Context and In Depth” *April 10, 2018*
 Science Movie Night: Natural History Museum of Utah

Outreach Lecture: “Robotics: Computing Interacting with the World” *April 2017*
 Red, White, and U Day: University of Utah

Outreach Demonstration: “How to Program a Robot” *April 2016, April 2017*
 Project Youth: University of Utah

Outreach Demonstration: “Robot Learning for Manipulation” *November 2016, November 2017*
 Engineering Day: University of Utah

Academic Service: Internal

School of Computing, University of Utah	2017
Proposed Department Standardization for Responsible Conduct in Research Training	
Graduate Visit Weekend, School of Computing, University of Utah	2017
Poster Session Organizer	
School of Computing, University of Utah	Fall 2016, 2017
Graduate Bootcamp Instructor	
School of Computing, University of Utah	2016–2017
Colloquium Chair	
Diversity Committee, School of Computing, University of Utah	2016–present
Committee Member	
Faculty Hiring Committee: CS Gemstone, School of Computing, University of Utah	2016–2017
Committee Member	
Faculty Hiring Committee: Computer Vision, School of Computing, University of Utah	2015–2016
Committee Member	
Graduate Admissions Committee, School of Computing, University of Utah	2016, 2017
Committee Member	

Students

Advising

> Michael Bentley (co-advised by Prof. Gopalakrishnan)	Ph.D. Computing: Robotics
> Adam Conkey	Ph.D. Computing: Robotics
> Qingkai Lu	Ph.D. Computing: Robotics
> Roya Sabbagh Novin (co-advised by Prof. Merryweather)	Ph.D. Mechanical Engineering: Robotics
> Balakumar Sundaralingam	Ph.D. Computing: Robotics
> Dustin Webb (co-advised by Prof. Venkatasubramanian)	Ph.D. Computing: Robotics
> Mohanraj Devendran Shantihi	M.S. Computer Science
> Kanrun Huang	M.S. Computing: Robotics
> James Watson	M.S. Mechanical Engineering
> Matthew Wilson (2018 UROP Scholar)	B.S. Computer Engineering

Committee Member

> Joey Bourne	Ph.D. Mechanical Engineering: Robotics
> James Carrico	Ph.D. Mechanical Engineering: Robotics
> Ashkan Pourkand	Ph.D. Computing: Robotics
> Ankur Rathore	Ph.D. Computing: Graphics and Visualization
> Ali Samarefilsoofi	Ph.D. Mechanical Engineering: Robotics

Graduated

> Hunter Brown	B.S./M.S. Mechanical Engineering (Spring 2018)
> Kautilya Chenna	M.S. Mechanical Engineering (Summer 2018)
> Philip Erickson	M.S. Computer Science (Fall 2016)
> Janine Hölscher	TU Darmstadt, B.S. Informatik (Fall 2014)
> Tyler Jones	M.S. Mechanical Engineering: Robotics (Fall 2016)
> Jiani Lin	M.S. Computer Science (Spring 2017)
> Jackson Ponsler	M.S. Computing: Robotics (Fall 2016)
> Hassan Zia	M.S. Mechanical Engineering: Robotics (Spring 2018)

Publications

Journal Articles

- [J1] B. Sundarlingam and T. Hermans. “Relaxed-Rigidity Constraints: Kinematic Trajectory Optimization and Collision Avoidance for In-Grasp Manipulation.” *Autonomous Robots: Special Issue on RSS 2017*, 2018.
- [J2] F. Veiga, J. Peters, and T. Hermans. “Stabilization of Novel Objects using Slip Prediction.” *IEEE Transactions on Haptics*, 2018.

Conference and Workshop Papers

- [C1] R. S. Novin, A. Yazdani*, T. Hermans, and A. Merryweather. “Dynamics Model Learning and Manipulation Planning for Objects in Hospitals using a Patient Assistant Mobile (PAM) Robot.” *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2018.
- [C2] B. Sundaralingam and T. Hermans. “Geometric In-Hand Regrasp Planning: Alternating Optimization of Finger Gaits and In-Grasp Manipulation.” *IEEE International Conference on Robotics and Automation (ICRA)*, 2018.
- [C3] Q. Lu, K. Chenna, B. Sundaralingam, and T. Hermans. “Planning Multi-Fingered Grasps as Probabilistic Inference in a Learned Deep Network.” *International Symposium on Robotics Research*, 2017.
- [C4] B. Sundaralingam and T. Hermans. “Relaxed-Rigidity Constraints: In-Grasp Manipulation using Purely Kinematic Trajectory Optimization.” *Robotics: Science and Systems*, 2017.
- [C5] K. M. Popek*, T. Hermans, and J. J. Abbott. “First Demonstration of Simultaneous Localization and Propulsion of a Magnetic Capsule in a Lumen using a Single Rotating Magnet.” *IEEE International Conference on Robotics and Automation (ICRA)*, 2017. **Best Medical Robotics Paper Award**
- [C6] Z. Yi, R. Calandra, H. van Hoof, F. Veiga, T. Hermans, Y. Zhang, and J. Peters. “Active Tactile Object Exploration with Gaussian Processes,” *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2016.
- [C7] J. Hoelscher, J. Peters, and T. Hermans. “Evaluation of Tactile Feature Extraction for Interactive Object Recognition.” *IEEE-RAS International Conference on Humanoid Robotics (Humanoids)*, 2015.
- [C8] H. van Hoof, T. Hermans, G. Neumann, and J. Peters. “Learning Robot In-Hand Manipulation with Tactile Features.” *IEEE-RAS International Conference on Humanoid Robotics (Humanoids)*, 2015.
- [C9] F. Veiga, H. van Hoof, J. Peters, and T. Hermans. “Detecting Slip and Stabilizing Grip of Novel Objects with Tactile Sensing.” *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Hamburg, Germany, 2015.
- [C10] T. Hermans, F. Li, J. M. Rehg, A. F. Bobick. “Learning Contact Locations for Pushing and Orienting Unknown Objects.” *IEEE-RAS International Conference on Humanoid Robotics (Humanoids)*, Atlanta, GA, USA, October 2013.
- [C11] A. Ciptadi, T. Hermans, J. M. Rehg, “An In Depth View of Saliency.” *British Machine Vision Conference (BMVC)*, Bristol, United Kingdom, September 2013.
- [C12] T. Hermans, F. Li, J. M. Rehg, A. F. Bobick. “Learning Stable Pushing Locations.” *IEEE International Conference on Developmental Learning and Epigenetic Robotics (ICDL-Epirob)*, Osaka, Japan, August 2013.
- [C13] T. Hermans, J. M. Rehg, A. F. Bobick. “Decoupling Behavior, Perception, and Control for Autonomous Learning of Affordances.” *IEEE International Conference on Robotics and Automation (ICRA)*, Karlsruhe, Germany, May 2013.
- [C14] T. Hermans, J. M. Rehg, A. F. Bobick. “Decoupling Behavior, Control, and Perception in Affordance-Based Manipulation.” *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS): Workshop on Cognitive Assistive Systems*, Vilamoura, Portugal, October 2012.
- [C15] T. Hermans, J. M. Rehg, A. F. Bobick. “Guided Pushing for Object Singulation.” *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Vilamoura, Portugal, October 2012.
- [C16] A. Cosgun, T. Hermans, V. Emeli, M. Stilman, “Push Planning for Object Placement on Cluttered Table Surfaces.” *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2011.
- [C17] T. Hermans, J. M. Rehg, A. F. Bobick, “Affordance Prediction via Learned Object Attributes,” *ICRA Workshop on Semantic Perception, Mapping, and Exploration*, 2011.

[C18] H. Zhou, T. Hermans, A. V. Karandikar, J. M. Rehg, "Movie Genre Classification via Scene Categorization." *ACM Multimedia*, Florence, Italy, November 2010.

[C19] H. Work, E. Chown, T. Hermans, J. Butterfield, M. McGranaghan, "Player Positioning in the Four-Legged League." *RoboCup: Robot Soccer World Cup XII*. Suzhou, China, 2008.

[C20] H. Work, E. Chown, T. Hermans, J. Butterfield, "Robust Team-Play in Highly Uncertain Environments." *International Joint Conference on Autonomous Agents and Multiagent Systems*. Estoril, Portugal, May 2008.

Peer Reviewed Demonstrations

[D1] T. Hermans, F. Veiga, H. van Hoof, J. Hoelscher, J. Peters, "Demonstration: Learning for Tactile Manipulation." *Neural Information Processing Systems (NIPS)*, Montreal, Canada, December 2014.

Tech Reports

[T1] T. Hermans, J. Strom, G. Slavov, J. Morrison, A. Lawrence, E. Krob, E. Chown, "Northern Bites 2009 Team Report." *Bowdoin College, Tech. Rep.*, 2009.

[T2] E. Chown, J. Fishman, J. Strom, G. Slavov, T. Hermans, N. Dunn, A. Lawrence, J. Morrison, E. Krob, "Northern Bites 2008 Standard Platform Robot Team." *Bowdoin College, Tech. Rep.*, 2008.

Key

- > Underlined - Student advisee
- > Starred* - Committee student

Funding

Current

1. NSF: CRII: RI: Enabling Manipulation of Object Collections via Self-Supervised Robot Learning (PI) \$175,000
2. NIH: R01: Biomechanics of Reverse Total Shoulder Arthroplasty (Senior Personnel) \$2,003,321
Added as senior personnel after grant was awarded

Pending

1. NSF: NRI: INT: Adaptive Robotic Therapy for Gait Rehabilitation (co-PI) \$985,071
2. NSF: EAGER: Real-Time: Verification for Decision-Making in Partially Observable Domains (PI) \$102,326
3. NSF: EAGER: EAGER: Toward Magnetic Manipulation of Nonmagnetic Objects (co-PI) \$248,739

Declined

1. NSF: CRII: RI: Autonomous Robot Manipulation of Object Groups (PI) \$175,000 (2015)
2. NSF: NRI: Intuitive Telemanipulation with Underactuated Tactile Hands under Arbitrary Latency (PI) \$649,910 (2016)
3. NIH: R21: Deciphering a Pain Profile for Personalized Rehabilitation (co-PI) \$394,345 (2016)
4. NSF: CMII: Dynamics and Control of Magnetic Screws in Soft Tissue (co-PI) \$421,267 (2016)
5. NSF: CHS: Medium: Revisiting Teleprogramming for Robust Arbitrary Latency Remote Manipulation (PI) \$999,727 (2016)
6. NSF: RI: Small: Magnetic Manipulation of Non-magnetic Materials (co-PI) \$499,941 (2016)
7. University of Utah Seed Grant: Causal Inference and Discovery for Learning Robots (PI) \$34,047 (2017)
8. NSF: CAREER: Unified Learning-Planning Algorithms for Multi-fingered Robotic Manipulation (PI) \$595,161 (2017)
9. DOE: NEUP: Robot-augmented Telemanipulation in Hot Cells for Improved Abilities and Ergonomics (co-PI) \$1,199,998 (2017)
10. NSF: CHS: Small: Revisiting Teleprogramming for Robust Remote Manipulation under Arbitrary Latency (PI) \$499,837 (2017)
11. NSF: RI: Small: Magnetic Manipulation of Unknown Objects (co-PI) \$499,940 (2017)

Teaching

University of Utah

- › CS 6370 / ME EN 6225 “Motion Planning” *Fall 2015, Fall 2016, Fall 2017, Fall 2018*
- › CS 7939 / ME EN 7960 “Seminar in Robotics” *Fall 2015, Fall 2016, Fall 2017*
- › CS 6300 “Artificial Intelligence” *Spring 2016, Spring 2018*
- › CS 7930 “School of Computing Colloquium” *Spring 2016, Fall 2016, Spring 2017, Fall 2017*
- › CS 7930 “Intro to Computing PhD” *Fall 2018*