

## Table of Contents

<b>I. Earned Degrees</b>	<b>1</b>
<b>II. Employment History</b>	<b>1</b>
<b>III. Honors and Awards</b>	<b>2</b>
A. International or National Awards . . . . .	2
B. Institute or School Awards . . . . .	2
<b>IV. Research, Scholarship, and Creative Activities</b>	<b>2</b>
A. Published Books, Book Chapters, and Edited Volumes . . . . .	3
B. Refereed Publications and Submitted Articles . . . . .	3
C. Other Publications and Creative Products . . . . .	11
D. Presentations . . . . .	13
E. Other Scholarly and Creative Accomplishments . . . . .	17
F. Societal and Policy Impacts . . . . .	18
G. Other Professional Activities . . . . .	18
<b>V. Education</b>	<b>19</b>
A. Courses Taught . . . . .	19
B. Individual Student Guidance . . . . .	19
C. Educational Innovations and Other Contributions . . . . .	23
<b>VI. Service</b>	<b>24</b>
A. Professional Contributions . . . . .	24
B. Public and Community Service . . . . .	26
C. Institute Contributions . . . . .	26

# Charles C. Kemp, Ph.D.

Associate Professor  
Wallace H. Coulter Department of Biomedical Engineering

*Conflict of Interest Statement: Dr. Kemp owns equity in and works for Hello Robot Inc., which is commercializing robotic assistance technologies initially developed in his lab.*

## I. Earned Degrees

- ◇ **Ph.D., Electrical Engineering and Computer Science**  
Massachusetts Institute of Technology  
Advisor: Prof. Rodney Brooks  
2005
- ◇ **M.Eng., Electrical Engineering and Computer Science**  
Massachusetts Institute of Technology  
1998
- ◇ **B.S., Computer Science and Engineering**  
Massachusetts Institute of Technology  
Minor: Cognitive Science  
1997

## II. Employment History

- ◇ **Co-founder & Chief Technology Officer (CTO)**  
August 2017 – present  
Hello Robot Inc.
- ◇ **Associate Professor**  
August 2013 – present  
Wallace H. Coulter Department of Biomedical Engineering  
Georgia Institute of Technology and Emory University
- ◇ **Adjunct**  
April 2011 – present  
School of Electrical and Computer Engineering  
Georgia Institute of Technology
- ◇ **Adjunct**  
February 2008 – present  
School of Interactive Computing  
Georgia Institute of Technology
- ◇ **Assistant Professor**  
August 2007 – June 2013  
Wallace H. Coulter Department of Biomedical Engineering  
Georgia Institute of Technology and Emory University
- ◇ **Senior Research Scientist**  
September 2006 – August 2007  
Health Systems Institute and Wallace H. Coulter Department of Biomedical Engineering  
Georgia Institute of Technology and Emory University

- ◇ **Postdoctoral Researcher**  
September 2005 – July 2006  
Computer Science and Artificial Intelligence Laboratory  
Massachusetts Institute of Technology  
Research Advisor: Rodney Brooks
- ◇ **Graduate Research Assistant**  
December 1998 – May 2005  
AI Lab and Computer Science and Artificial Intelligence Laboratory  
Massachusetts Institute of Technology  
Research Advisor: Rodney Brooks

### III. Honors and Awards

#### A. International or National Awards

2019	One of 19 papers selected as PLOS ONE “Editors’ Picks 2019”
2019	Facebook Reality Labs Distinguished Faculty Award
2019	Best Student Paper Award, International Conference on Rehabilitation Robotics (ICORR)
2019	Best Paper Finalist, Conference on Computer Vision and Pattern Recognition (CVPR)
2019	Best Paper Award in Service Robotics – Finalist, IEEE International Conference on Robotics and Automation (ICRA)
2015	Google Faculty Research Award
2014	Finalist for RoboCup Best Paper Award at IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
2013	Best paper finalist, IEEE-RAS International Conference on Humanoid Robots
2012	Early Career Spotlight talk at Robotics: Science and Systems (RSS)
2012	Atlanta Magazine Groundbreaker Award for the robot GATSBII
2012	NSF CAREER Award
2011	3M Non-Tenured Faculty Award
2010	Finalist for KUKA Service Robotics Best Paper Award at ICRA
2009	Nominee for World Technology Award
2007	Best paper finalist ( <i>top 4</i> ), International Conference on Advanced Robotics
2006	Best paper award, IEEE-RAS International Conference on Humanoid Robotics
MIT grad	Sigma Xi, scientific research honor society
MIT undergrad	Tau Beta Pi, national engineering honor society
MIT undergrad	Eta Kappa Nu, IEEE electrical and computer engineering honor society

#### B. Institute or School Awards

2018	Class of 1940 Course Survey Teaching Effectiveness Award
2017	Hesburgh Award Teaching Fellow
2011	Georgia Tech Research Corporation Robotics Award

### IV. Research, Scholarship, and Creative Activities

An asterisk denotes a publication resulting from work performed at Georgia Tech. **Boldface for co-authors** represents students and trainees advised by Prof. Kemp.

## A. Published Books, Book Chapters, and Edited Volumes

### A.1. Refereed Book Chapters

1. Aaron Edsinger and Charles C. Kemp. *Recent Progress in Robotics: Viable Robotic Service to Human*, volume 370 of *Lecture Notes in Control and Information Sciences*, chapter : Two Arms Are Better Than One: A Behavior Based Control System for Assistive Bimanual Manipulation, pages 345–355. Springer, Berlin / Heidelberg, 2008

### A.2. Edited Volumes

1. \*Paul Fitzpatrick, Kensuke Harada, Charles C. Kemp, Yoshio Matsumoto, Kazuhito Yokoi, and Eiichi Yoshida. Humanoids. In *Springer Handbook of Robotics*, pages 1789–1818. Springer, 2016
2. \*Charles C. Kemp, Paul Fitzpatrick, Hirohisa Hirukawa, Kazuhito Yokoi, Kensuke Harada, and Yoshio Matsumoto. *Springer Handbook of Robotics*, chapter 56: Humanoids, pages 1307–1333. Springer, July 2008

## B. Refereed Publications and Submitted Articles

### B.1. Published and Accepted Journal Articles

1. \*Yunbo Zhang, Wenhao Yu, C. Karen Liu, Charles. C. Kemp, and Greg Turk. Learning to manipulate amorphous materials. *accepted to ACM Transactions on Graphics (TOG)*, 2020
2. \*Alexander Clegg, **Zackory Erickson**, **Patrick Grady**, Greg Turk, Charles C. Kemp, and C Karen Liu. Learning to collaborate from simulation for robot-assisted dressing. *IEEE Robotics and Automation Letters*, 5(2):2746–2753, 2020
3. \***Daehyung Park**, **Yuuna Hoshi**, Harshal P. Mahajan, **Ho Keun Kim**, **Zackory Erickson**, Wendy A. Rogers, and Charles C. Kemp. Active robot-assisted feeding with a general-purpose mobile manipulator: Design, evaluation, and lessons learned. *Robotics and Autonomous Systems*, 2019
4. \***Ariel S. Kapusta**, **Phillip M. Grice**, **Henry M. Clever**, **Yash Chitalia**, **Daehyung Park**, and Charles C. Kemp. A system for bedside assistance that integrates a robotic bed and a mobile manipulator. *PloS one*, 14(10):e0221854, 2019
5. \***Ariel S. Kapusta**, **Zackory Erickson**, **Henry M. Clever**, Wenhao Yu, C Karen Liu, Greg Turk, and Charles C. Kemp. Personalized collaborative plans for robot-assisted dressing via optimization and simulation. *Autonomous Robots*, pages 1–25, 2019
6. \***Daehyung Park**, **Hokeun Kim**, and Charles C. Kemp. Multimodal anomaly detection for assistive robots. *Autonomous Robots*, 43(3):611–629, 2019
7. \***Phillip M. Grice** and Charles C. Kemp. In-home and remote use of robotic body surrogates by people with profound motor deficits. *PloS one*, 14(3):e0212904, 2019
8. \***Zackory Erickson**, **Nathan Luskey**, Sonia Chernova, and Charles C. Kemp. Classification of household materials via spectroscopy. *IEEE Robotics and Automation Letters*, 4(2):700–707, 2019
9. \***Ariel S. Kapusta** and Charles C. Kemp. Task-centric optimization of configurations for assistive robots. *Autonomous Robots*, pages 1–22, 2019
10. \***Zackory Erickson**, **Maggie Collier**, **Ariel S. Kapusta**, and Charles C. Kemp. Tracking human pose during robot-assisted dressing using single-axis capacitive proximity sensing. *IEEE Robotics and Automation Letters*, 3(3):2245–2252, 2018

11. \***Daehyung Park, Yuuna Hoshi,** and Charles C. Kemp. A multimodal anomaly detector for robot-assisted feeding using an LSTM-based variational autoencoder. *IEEE Robotics and Automation Letters*, 3(3):1544–1551, 2018
12. \***Tapomayukh Bhattacharjee, Henry M. Clever, Joshua Wade,** and Charles C. Kemp. Multimodal tactile perception of objects in a real home. *IEEE Robotics and Automation Letters*, 3(3):2523–2530, 2018
13. \*Tracy L Mitzner, Lorenza Tiberio, Charles C. Kemp, and Wendy Rogers. Understanding healthcare providers’ perceptions of a personal assistant robot. *Gerontechnology*, 17(1):48–55, 2018
14. \***Tiffany L. Chen, Tapomayukh Bhattacharjee,** Jenay M Beer, Lena H Ting, Madeleine E Hackney, Wendy A Rogers, and Charles C. Kemp. Older adults’ acceptance of a robot for partner dance-based exercise. *PloS one*, 12(10):e0182736, 2017
15. \*Andrew Sawers, **Tapomayukh Bhattacharjee,** J Lucas McKay, Madeleine E Hackney, Charles C. Kemp, and Lena H Ting. Small forces that differ with prior motor experience can communicate movement goals during human-human physical interaction. *Journal of neuroengineering and rehabilitation*, 14(1):8, 2017
16. \***Joshua Wade, Tapomayukh Bhattacharjee, Ryan D. Williams,** and Charles C. Kemp. A force and thermal sensing skin for robots in human environments. *Robotics and Autonomous Systems*, 96:1–14, 2017
17. \***Tapomayukh Bhattacharjee,** James M Rehg, and Charles C. Kemp. Inferring object properties with a tactile-sensing array given varying joint stiffness and velocity. *International Journal of Humanoid Robotics*, page 1750024, 2017
18. \*Jenay M. Beer, Akanksha Prakash, Cory-Ann Smarr, Tiffany L. Chen, Kelsey Hawkins, Hai Nguyen, Travis Deyle, Tracy Mitzner, Charles C. Kemp, and Wendy Rogers. Older users’ acceptance of an assistive robot: Attitudinal changes following brief exposure. *Gerontechnology*, 16:21–36, 2017
19. \***Marc D. Killpack, Ariel S. Kapusta,** and Charles C. Kemp. Model predictive control for fast reaching in clutter. *Autonomous Robots*, 40(3):537–560, 2016
20. \***Tiffany L. Chen, Tapomayukh Bhattacharjee,** J Lucas McKay, **Jacquelyn E. Borinski,** Madeleine E. Hackney, Lena H Ting, and Charles C. Kemp. Evaluation by expert dancers of a robot that performs partnered stepping via haptic interaction. *PloS one*, 10(5):e0125179, 2015
21. \*Cory-Ann Smarr, Tracy L. Mitzner, Jenay M. Beer, Akanksha Prakash, **Tiffany L. Chen,** Charles C. Kemp, and Wendy A. Rogers. Domestic robots for older adults: Attitudes, preferences, and potential. *International Journal of Social Robotics*, 6(2):229–247, 2014
22. \*TracyL. Mitzner, **Tiffany L. Chen,** Charles C. Kemp, and Wendy A. Rogers. Identifying the potential for robotics to assist older adults in different living environments. *International Journal of Social Robotics*, 6(2):213–227, 2014
23. \***Hai Nguyen** and Charles C. Kemp. Autonomously learning to visually detect where manipulation will succeed. *Autonomous Robots*, pages 1–16, 2013
24. \***Tiffany L. Chen, Chih-Hung King,** Andrea L. Thomaz, and Charles C. Kemp. An investigation of responses to robot-initiated touch in a nursing context. *International Journal of Social Robotics*, pages 1–21, 2013
25. \***Advait Jain** and Charles C. Kemp. Improving robot manipulation with data-driven object-centric models of everyday forces. *Autonomous Robots*, 35:143–159, 2013

26. \***Advait Jain, Marc D. Killpack**, Aaron Edsinger, and Charles C. Kemp. Reaching in clutter with whole-arm tactile sensing. *The International Journal of Robotics Research*, 32(4):458–482, 2013
27. \***Tiffany L. Chen**, Matei Ciocarlie, Steve Cousins, **Phillip M. Grice**, **Kelsey Hawkins**, Kaijen Hsiao, Charles C. Kemp, **Chih-Hung King**, Daniel A. Lazewatsky, Adam Leeper, **Hai Nguyen**, Andreas Paepcke, Caroline Pantofaru, William D. Smart, and Leila Takayama. Robots for humanity: Using assistive robotics to empower people with disabilities. *IEEE Robotics & Automation Magazine*, 20:30–39, 2013
28. \***Chih-Hung King**, **Tiffany L. Chen**, **Zhengqin Fan**, Jonathan D. Glass, and Charles C. Kemp. Dusty: an assistive mobile manipulator that retrieves dropped objects for people with motor impairments. *Disability and Rehabilitation: Assistive Technology*, 7(2):168–179, 2012. PMID: 22013888
29. \***Tiffany L. Chen** and Charles C. Kemp. A direct physical interface for navigation and positioning of a robotic nursing assistant. *Advanced Robotics*, 25(5):605–627, 2011
30. \***Travis Deyle**, **Hai Nguyen**, Matt Reynolds, and Charles C. Kemp. RFID-guided robots for pervasive automation. *IEEE Pervasive Computing*, 9(2):37–45, April-June 2010
31. \***Advait Jain** and Charles C. Kemp. El-e: An assistive mobile manipulator that autonomously fetches objects from flat surfaces. *Autonomous Robots*, 28(1):45–64, January 2010
32. \*Charles C. Kemp, Aaron Edsinger, and Eduardo Torres-Jara. Challenges for robot manipulation in human environments. *IEEE Robotics & Automation Magazine*, 14(1):20–29, March 2007
33. \*Rodney Brooks, Lijin Aryananda, Aaron Edsinger, Paul Fitzpatrick, Charles C. Kemp, Una-May O’Reilly, Eduardo Torres-Jara, Paulina Varshavskaya, and Jeff Weber. Sensing and manipulating built-for-human environments. *International Journal of Humanoid Robotics (IJHR)*, 1:1–28, March 2004

## B.2. Conference Presentation with Proceedings (Refereed)

1. \*Samarth Brahmabhatt, Chengcheng Tang, Christopher D. Twigg, Charles C. Kemp, and James Hays. ContactPose: A dataset of grasps with object contact and hand pose. In *The European Conference on Computer Vision (ECCV)*, 2020
2. \***Zackory Erickson**, **Yijun Gu**, and Charles C. Kemp. Assistive VR Gym: Interactions with real people to improve virtual assistive robots. In *IEEE International Conference on Robot and Human Interactive Communication (RO-MAN)*, 2020
3. \***Zackory Erickson**, **Eliot Xing**, **Bharat Srirangam**, Sonia Chernova, and Charles C. Kemp. Multi-modal material classification for robots using spectroscopy and high resolution texture imaging. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2020
4. \***Henry M. Clever**, **Zackory Erickson**, **Ariel S. Kapusta**, Greg Turk, Karen Liu, and Charles C. Kemp. Bodies at rest: 3D human pose and shape estimation from a pressure image using synthetic data. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, June 2020
5. \*Samarth Brahmabhatt, Cusuh Ham, Charles C. Kemp, and James Hays. ContactDB: Analyzing and predicting grasp contact via thermal imaging. *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2019
6. \***Zackory Erickson**, **Henry M. Clever**, **Vamsee Gangaram**, Greg Turk, C Karen Liu, and Charles C. Kemp. Multidimensional capacitive sensing for robot-assisted dressing and bathing. *International Conference on Rehabilitation Robotics (ICORR)*, 2019

7. **\*Henry M. Clever, Ariel S. Kapusta, Daehyung Park, Zackory Erickson, Yash Chitalia,** and Charles C. Kemp. 3D human pose estimation on a configurable bed from a pressure image. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 54–61. IEEE, 2018
8. **\*Haoping Bai, Tapomayukh Bhattacharjee, Haofeng Chen, Ariel S. Kapusta,** and Charles C. Kemp. Towards material classification of scenes using active thermography. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 4262–4269. IEEE, 2018
9. **\*Zackory Erickson, Henry M. Clever,** Greg Turk, C Karen Liu, and Charles C. Kemp. Deep haptic model predictive control for robot-assisted dressing. In *IEEE International Conference on Robotics and Automation (ICRA)*, pages 1–8. IEEE, 2018
10. **\*Zackory Erickson,** Sonia Chernova, and Charles C. Kemp. Semi-supervised haptic material recognition for robots using generative adversarial networks. *1st Annual Conference on Robot Learning (CoRL)*, 2017
11. **\*Zackory Erickson,** Alexander Clegg, Wenhao Yu, Greg Turk, C Karen Liu, and Charles C. Kemp. What does the person feel? learning to infer applied forces during robot-assisted dressing. In *IEEE International Conference on Robotics and Automation (ICRA)*, pages 6058–6065. IEEE, 2017
12. **\*Daehyung Park, Hokeun Kim, Yuuna Hoshi, Zackory Erickson, Ariel S. Kapusta,** and Charles C. Kemp. A multimodal execution monitor with anomaly classification for robot-assisted feeding. In *IEEE International Conference on Robots and Systems (IROS)*, 2017
13. **\*Wenhao Yu, Ariel S. Kapusta,** Jie Tan, Charles C. Kemp, Greg Turk, and C Karen Liu. Haptic simulation for robot-assisted dressing. In *IEEE International Conference on Robotics and Automation (ICRA)*, pages 6044–6051. IEEE, 2017
14. **\*Daehyung Park, Zackory Erickson, Tapomayukh Bhattacharjee,** and Charles C. Kemp. Multimodal execution monitoring for anomaly detection during robot manipulation. In *IEEE International Conference on Robotics and Automation (ICRA)*, pages 407–414, 2016
15. **\*Ashwin A. Shenoi, Tapomayukh Bhattacharjee,** and Charles C. Kemp. A CRF that combines touch and vision for haptic mapping. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 2255–2262, 2016
16. **\*Ariel S. Kapusta,** Wenhao Yu, **Tapomayukh Bhattacharjee,** C. Karen Liu, Greg Turk, and Charles C. Kemp. Data-driven haptic perception for robot-assisted dressing. In *IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN)*, pages 451–458, Aug 2016
17. **\*Kevin Chow** and Charles C. Kemp. Robotic repositioning of human limbs via model predictive control. In *IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN)*, pages 473–480, Aug 2016
18. **\*Tapomayukh Bhattacharjee, Joshua Wade, Yash Chitalia,** and Charles C. Kemp. Data-driven thermal recognition of contact with people and objects. In *IEEE Haptics Symposium (HAPTICS)*, pages 297–304, 2016
19. **\*Phillip M. Grice, Yash Chitalia, Megan Rich, Henry M. Clever,** and Charles C. Kemp. Autobed: Open hardware for accessible web-based control of an electric bed. In *Annual Conference of the Rehabilitation Engineering and Assistive Technology Society of North America (RESNA)*, 2016
20. **\*Tapomayukh Bhattacharjee, Joshua Wade,** and Charles C. Kemp. Material recognition from heat transfer given varying initial conditions and short-duration contact. In *Robotics Science and Systems (RSS)*, 2015

21. \***Tapomayukh Bhattacharjee, Ashwin A. Shenoi, Daehyung Park**, James M. Rehg, and Charles C. Kemp. Combining tactile sensing and vision for rapid haptic mapping. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2015
22. \***Ariel S. Kapusta, Daehyung Park**, and Charles C. Kemp. Task-centric selection of robot and environment initial configurations for assistive tasks. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2015
23. \***Kelsey Hawkins, Phillip M. Grice, Tiffany L. Chen, Chih-Hung King**, and Charles C. Kemp. Assistive mobile manipulation for self-care tasks around the head. In *IEEE Symposium on Computational Intelligence in Robotic Rehabilitation and Assistive Technologies*, December 2014
24. \***Daehyung Park, Ariel S. Kapusta, Jeffrey Hawke**, and Charles C. Kemp. Interleaving planning and control for efficient haptically-guided reaching in unknown environments. In *IEEE-RAS International Conference on Humanoid Robots (Humanoids)*, 2014
25. \***Travis Deyle**, Matt Reynolds, and Charles C. Kemp. Finding and navigating to household objects with UHF RFID tags by optimizing RF signal strength. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2014
26. \***Daehyung Park, Ariel S. Kapusta, You Keun Kim**, James M. Rehg, and Charles C. Kemp. Learning to reach into the unknown: Selecting initial conditions when reaching in clutter. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2014
27. \***Akanksha Prakash**, Charles C. Kemp, and Wendy A. Rogers. Older adults' reactions to a robot's appearance in the context of home use. In *Proceedings of the 2014 ACM/IEEE International Conference on Human-robot Interaction*, pages 268–269, New York, NY, USA, 2014. ACM
28. \***Marc D. Killpack** and Charles C. Kemp. Fast reaching in clutter while regulating forces using model predictive control. In *IEEE-RAS International Conference on Humanoid Robots (Humanoids)*, 2013
29. \***Tapomayukh Bhattacharjee, Ariel S. Kapusta**, James M. Rehg, and Charles C. Kemp. Rapid categorization of object properties from incidental contact with a tactile sensing robot arm. In *IEEE-RAS International Conference on Humanoid Robots (Humanoids)*, 2013
30. \***Phillip M. Grice, Marc D. Killpack, Advait Jain, Sarvagya Vaish, Jeffrey Hawke**, and Charles C. Kemp. Whole-arm tactile sensing for beneficial and acceptable contact during robotic assistance. In *13th International Conference on Rehabilitation Robotics (ICORR)*, 2013
31. \***Tapomayukh Bhattacharjee, Advait Jain, Sarvagya Vaish, Marc D. Killpack**, and Charles C. Kemp. Tactile sensing over articulated joints with stretchable sensors. In *IEEE World Haptics Conference (WHC)*, April 2013
32. \***Hai Nguyen**, Matei Ciocarlie, Kaijen Hsiao, and Charles C. Kemp. ROS Commander (ROSCo): Behavior creation for home robots. In *IEEE International Conference on Robotics and Automation (ICRA)*, 2013
33. \***Travis Deyle**, Christopher Tralie, Matthew Reynolds, and Charles C. Kemp. In-hand radio frequency identification (RFID) for robotic manipulation. In *IEEE International Conference on Robotics and Automation (ICRA)*, 2013
34. \***Akanksha Prakash**, Jenay M. Beer, **Travis Deyle**, Cory-Ann Smarr, **Tiffany L. Chen**, Tracy L. Mitzner, Charles C. Kemp, and Wendy A. Rogers. Older adults medication management in the home: How can robots help? In *ACM/IEEE international conference on Human-Robot Interaction (HRI)*, 2013



35. \***Tapomayukh Bhattacharjee**, James M. Rehg, and Charles C. Kemp. Haptic classification and recognition of objects using a tactile sensing forearm. In *International Conference on Intelligent Robots and Systems (IROS)*, 2012
36. \***Kelsey Hawkins**, **Chih-Hung King**, **Tiffany L. Chen**, and Charles C. Kemp. Informing assistive robots with models of contact forces from able-bodied face wiping and shaving. In *21st IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN)*, 2012
37. \***Phillip M. Grice**, Andy Lee, Henry W. Evans, and Charles C. Kemp. The wouse: A wearable wince detector to stop assistive robots. In *21st IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN)*, 2012
38. \*Cory-Ann Smarr, Akanksha Prakash, Jenay Beer, Tracy Mitzner, Charles C. Kemp, and Wendy Rogers. Older adults' preferences for and acceptance of robot assistance for everyday living tasks. In *Human Factors and Ergonomics Society's 56th Annual Meeting (HFES)*, 2012
39. \*Jenay M. Beer, Cory-Ann Smarr, Akanksha Prakash, Tracy Mitzner, Charles C. Kemp, and Wendy Rogers. "telling your robot what to do" older adults preferences for controlling home robots. In *Human Factors and Ergonomics Society's 56th Annual Meeting (HFES)*, 2012
40. \*Jenay M. Beer, Cory-Ann Smarr, **Tiffany L. Chen**, Akanksha Prakash, Tracy L. Mitzner, Charles C. Kemp, and Wendy A. Rogers. The domesticated robot: design guidelines for assisting older adults to age in place. In *ACM/IEEE international conference on Human-Robot Interaction (HRI)*, pages 335–342. ACM, 2012
41. \*Tracy L. Mitzner, **Tiffany L. Chen**, Charles C. Kemp, and Wendy A. Rogers. Older adults' needs for assistance as a function of living environment. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 55(1):152–156, 2011
42. \***Tiffany L. Chen**, **Chih-Hung King**, Andrea L. Thomaz, and Charles C. Kemp. Touched by a robot: an investigation of subjective responses to robot-initiated touch. In *Proceedings of the 6th international conference on Human-robot interaction*, pages 457–464. ACM, 2011
43. \***Martin Schuster**, **Jason Okerman**, **Hai Nguyen**, James M. Rehg, and Charles C. Kemp. Perceiving clutter and surfaces for object placement in indoor environments. In *Humanoid Robots (Humanoids), 2010 10th IEEE-RAS International Conference on*, pages 152–159. IEEE, 2010
44. \***Chih-Hung King**, **Tiffany L. Chen**, **Advait Jain**, and Charles C. Kemp. Towards an assistive robot that autonomously performs bed baths for patient hygiene. In *Intelligent Robots and Systems (IROS), 2010 IEEE/RSJ International Conference on*, pages 319–324. IEEE, 2010
45. \*Jurgen Sturm, **Advait Jain**, Cyrill Stachniss, Charles C. Kemp, and Wolfram Burgard. Operating articulated objects based on experience. In *Intelligent Robots and Systems (IROS), 2010 IEEE/RSJ International Conference on*, pages 2739–2744. IEEE, 2010
46. \***Marc D. Killpack**, **Travis Deyle**, **Cressel Anderson**, and Charles C. Kemp. Visual odometry and control for an omnidirectional mobile robot with a downward-facing camera. In *Intelligent Robots and Systems (IROS), 2010 IEEE/RSJ International Conference on*, pages 139–146. IEEE, 2010
47. \***Advait Jain**, **Hai Nguyen**, **Mrinal Rath**, **Jason Okerman**, and Charles C. Kemp. The complex structure of simple devices: A survey of trajectories and forces that open doors and drawers. In *Biomedical Robotics and Biomechatronics (BioRob), 2010 3rd IEEE RAS and EMBS International Conference on*, pages 184–190. IEEE, 2010
48. \***Chih-Hung King**, **Marc D. Killpack**, and Charles C. Kemp. Effects of force feedback and arm compliance on teleoperation for a hygiene task. In *EuroHaptics*, pages 248–255. Springer, 2010

49. \***Advait Jain** and Charles C. Kemp. Pulling open doors and drawers: Coordinating an omni-directional base and a compliant arm with equilibrium point control. In *Robotics and Automation (ICRA), 2010 IEEE International Conference on*, pages 1807–1814. IEEE, 2010
50. \***Tiffany L. Chen** and Charles C. Kemp. Lead me by the hand: evaluation of a direct physical interface for nursing assistant robots. In *Proceeding of the 5th ACM/IEEE international conference on Human-robot interaction*, pages 367–374. ACM, 2010
51. \***Advait Jain** and Charles C. Kemp. Pulling open novel doors and drawers with equilibrium point control. In *Humanoid Robots, 2009. Humanoids 2009. 9th IEEE-RAS International Conference on*, pages 498–505. IEEE, 2009
52. \***Travis Deyle, Hai Nguyen, Matt Reynolds, and Charles C. Kemp.** RF vision: RFID receive signal strength indicator (RSSI) images for sensor fusion and mobile manipulation. In *Proceedings of the IEEE/RJS International Conference on Intelligent Robots and Systems (IROS)*, pages 5553–5560, October 2009
53. \***Young Sang Choi, Tiffany L. Chen, Advait Jain, Cressel Anderson, Jonathan D. Glass, and Charles C. Kemp.** Hand it over or set it down: A user study of object delivery with an assistive mobile manipulator. In *Proceedings of the IEEE 18th International Symposium on Robot and Human Interactive Communication (RO-MAN)*, pages 736–743, September 2009
54. \***Young Sang Choi, Travis Deyle, Tiffany L. Chen, Jonathan D. Glass, and Charles C. Kemp.** A list of household objects for robotic retrieval prioritized by people with als. In *Proceedings of the IEEE 11th International Conference on Rehabilitation Robotics (ICORR)*, pages 510–517, June 2009
55. \***Zhe Xu, Travis Deyle, and Charles C. Kemp.** 1000 trials: An empirically validated end effector that robustly grasps objects from the floor. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, pages 2160–2167, May 2009
56. \***Alex Trevor, Hae Won Park, Ayanna Howard, and Charles C. Kemp.** Playing with toys: Towards autonomous robot manipulation for therapeutic play. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, pages 2139–2145, May 2009
57. \***Hai Nguyen** and Charles C. Kemp. Bio-inspired assistive robotics: Service dogs as a model for human-robot interaction and mobile manipulation. In *Proceedings of the IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics (BioRob 2008)*, pages 542–549, October 2008
58. \***Young Sang Choi, Cressel Anderson, Jonathan D. Glass, and Charles C. Kemp.** Laser pointers and a touch screen: Intuitive interfaces to an autonomous mobile robot for the motor impaired. In *Proceedings of the 10th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS 2008)*, pages 225–232, October 2008
59. \***Hai Nguyen, Advait Jain, Cressel Anderson, and Charles C. Kemp.** A clickable world: Behavior selection through pointing and context for mobile manipulation. In *Proceedings of the IEEE/RJS International Conference on Intelligent Robots and Systems (IROS)*, pages 787–793, September 2008
60. \***Travis Deyle, Charles C. Kemp, and Matt Reynolds.** Probabilistic UHF RFID tag pose estimation with multiple antennas and a multipath RF propagation model. In *Proceedings of the IEEE/RJS International Conference on Intelligent Robots and Systems (IROS)*, pages 1379–1384, September 2008
61. \***Travis Deyle, Cressel Anderson, Charles C. Kemp, and Matt Reynolds.** A foveated passive UHF RFID system for mobile manipulation. In *Proceedings of the IEEE/RJS International Conference on Intelligent Robots and Systems (IROS)*, pages 3711–3716, September 2008

62. \*Ayanna Howard, Hae Won Park, and Charles C. Kemp. Extracting play primitives for a robot playmate by sequencing low-level motion behaviors. In *Proceedings of the IEEE 17th International Symposium on Robot and Human Interactive Communication (RO-MAN)*, pages 360–365, August 2008
63. \*Charles C. Kemp, **Cressel Anderson**, **Hai Nguyen**, **Alexander J. Trevor**, and **Zhe Xu**. A point-and-click interface for the real world: Laser designation of objects for mobile manipulation. In *Proceedings of the 3rd ACM/IEEE International Conference on Human-Robot Interaction (HRI)*, pages 241–248, March 2008
64. Aaron Edsinger and Charles C. Kemp. Human-robot interaction for cooperative manipulation: Handling objects to one another. In *Proceedings of the 16th IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN)*, pages 1167–1172, August 2007
65. Aaron Edsinger and Charles C. Kemp. Two arms are better than one: A behavior-based control system for assistive bimanual manipulation. In *Proceedings of the 13th International Conference on Advanced Robotics (ICAR)*, August 2007
66. Aaron Edsinger and Charles C. Kemp. Manipulation in human environments. In *Proceedings of the IEEE-RAS International Conference on Humanoid Robotics (Humanoids06)*, pages 102–109, December 2006
67. Aaron Edsinger and Charles C. Kemp. What can i control? a framework for robot self-discovery. In *Proceedings of the Sixth International Conference on Epigenetic Robotics (EpiRob 2006)*, September 2006
68. Charles C. Kemp and Aaron Edsinger. What can i control?: The development of visual categories for a robot’s body and the world that it influences. In *Proceedings of the 5th IEEE International Conference on Development and Learning (ICDL5): Special Session on Perceptual Systems and their Developmen*, June 2006
69. Charles C. Kemp and Aaron Edsinger. Robot manipulation of human tools: Autonomous detection and control of task relevant features. In *Proceedings of the 5th IEEE International Conference on Development and Learning (ICDL5): Special Session on Classifying Activities in Manual Tasks*, June 2006
70. Paul Fitzpatrick and Charles C. Kemp. Shoes as a platform for vision. In *Proceedings of the Seventh IEEE International Symposium on Wearable Computers (ISWC)*, pages 231–234, October 2003
71. Charles C. Kemp. Duo: A human/wearable hybrid for learning about common manipulable objects. In *Proceedings of the Third IEEE International Conference on Humanoid Robots (Humanoids 2003)*, October 2003
72. Artur Arsenio, Paul Fitzpatrick, Charles C. Kemp, and Giorgio Metta. The whole world in your hand: Active and interactive segmentation. In *Proceedings of the Third International Workshop on Epigenetic Robotics*, volume 101, pages 49–56. Lund University Cognitive Studies, 2003
73. Rodney A. Brooks, Cynthia Breazeal (Ferrell), Robert Irie, Charles C. Kemp, Matthew Marjanovic, Brian Scassellati, and Matthew M. Williamson. Alternative essences of intelligence. In *Proceedings of the Fifteenth National Conference on Artificial Intelligence (AAAI-98)*, pages 961–968, September 1998

### B.3. Other Refereed Material

1. \***Phillip M. Grice** and Charles C. Kemp. Assistive mobile manipulation: Designing for operators with motor impairments. In *RSS workshop on Socially and Physically Assistive Robotics for Humanity*, 2016
2. \***Ariel S. Kapusta**, **Yash Chitalia**, **Daehyung Park**, and Charles C. Kemp. Collaboration between a robotic bed and a mobile manipulator may improve physical assistance for people with disabilities. In *RO-MAN workshop on behavior adaptation, interaction and learning for assistive robots (BAILAR)*, 2016

3. \***Tapomayukh Bhattacharjee, Phillip M. Grice, Ariel S. Kapusta, Marc D. Killpack, Daehyung Park,** and Charles C. Kemp. A robotic system for reaching in dense clutter that integrates model predictive control learning haptic mapping and planning. In *IROS workshop: 3rd Workshop on Robots in Clutter: Perception and Interaction in Clutter*, 2014
4. \***Hai Nguyen** and Charles C. Kemp. Autonomous active learning of task-relevant features for mobile manipulation. In *RSS workshop – Mobile Manipulation: Learning to Manipulate*, June 2011
5. \***Hai Nguyen, Travis Deyle,** Matt Reynolds, and Charles C. Kemp. Pps-tags: Physical, perceptual and semantic tags for autonomous mobile manipulation. In *IROS workshop: Semantic Perception for Mobile Manipulation*, October 2009
6. \***Advait Jain** and Charles C. Kemp. Behaviors for robust door opening and doorway traversal with a force-sensing mobile manipulator. *RSS Manipulation Workshop: Intelligence in Human Environments*, June 2008
7. \***Hai Nguyen, Cressel Anderson, Alexander J. Trevor, Advait Jain, Zhe Xu,** and Charles C. Kemp. El-e: An assistive robot that fetches objects from flat surfaces. In *Technical Report 470: Proceedings of "Robotic Helpers: User Interaction, Interfaces and Companions in Assistive and Therapy Robotics", a Workshop at ACM/IEEE HRI 2008, Amsterdam, the Netherlands*. University of Hertfordshire, UK, March 2008
8. Cynthia B. Ferrell and Charles C. Kemp. An ontogenetic perspective to scaling sensorimotor intelligence. In *Embodied Cognition and Action: Papers from the 1996 AAAI Fall Symposium*, 1996

#### B.4. Submitted Journal Articles (with Date of Submission)

1. \***Tapomayukh Bhattacharjee, Henry M. Clever, Joshua Wade,** and Charles C. Kemp. Material recognition via heat transfer given ambiguous initial conditions. *submitted to IEEE Transaction on Haptics in October*, 2020

### C. Other Publications and Creative Products

#### C.1. Software

##### ◇ Open Source Code from the Healthcare Robotics Lab

Dr. Kemp's lab has released open source software that can be found via <https://sites.gatech.edu/hr1/releases>. Software from Dr. Kemp's lab has been used by people across the world.

##### ◇ Open Source Code Written by Dr. Kemp

Dr. Kemp has written and released extensive open source robotics software through Hello Robot Inc. This open source code is being used by researchers at universities and industry research labs across the United States. Dr. Kemp made significant contributions to software that is preinstalled on the robot Stretch. Customers use this software for tasks such as calibration, teleoperation, and demonstrations of autonomous capabilities (see <https://github.com/hello-robot>). Marketing for the launch of the robot Stretch featured demonstrations using Dr. Kemp's code. The autonomy demonstrations directly relate to published research from Dr. Kemp's lab since 2007, which he has noted in online documentation found at <https://forum.hello-robot.com/t/autonomy-video-details>.

#### C.2. Patents

Dr. Kemp and his student Henry M. Clever invented a robot at Georgia Tech from October 2016 to July 2017. The intellectual property (IP) they generated was exclusively licensed and successfully commercialized by Hello Robot Inc. The following patent pending relates to this IP.

- ◇ U.S. Patent Application No. 62/473,778, Charles C. Kemp and Henry M. Clever, “A Low-Cost General-Purpose Mobile Manipulator for Indoor Use”, March 20, 2017, GTRC Reference Nos.: 7542

### C.3. Other Creative Products

- ◇ **Open Hardware, Open Data, and Open Course Materials**

Dr. Kemp and his lab have released open hardware, open data, and open course materials that can be found at <https://sites.gatech.edu/hr1/releases/>. Open hardware includes documentation and design files for whole-arm tactile sensors, a robotic bed, multimodal tactile sensors, and more.

- ◇ **Publications with Fewer than Two Reviewers**

1. \***Daehyung Park, You Keun Kim, Zackory Erickson**, and Charles C. Kemp. Towards assistive feeding with a general-purpose mobile manipulator. *ICRA workshop on Human-Robot Interfaces for Enhanced Physical Interactions*, 2016
2. \***Ariel S. Kapusta** and Charles C. Kemp. Optimization of robot configurations for assistive tasks. In *RSS workshop on Planning for Human-Robot Interaction: Shared Autonomy and Collaborative Robotics*, 2016
3. \***Joshua Wade, Tapomayukh Bhattacharjee**, and Charles C. Kemp. Force and thermal sensing with a fabric-based skin. In *IROS workshop on See, Touch, and Hear : 2nd Workshop on Multimodal Sensor-based Robot Control for HRI and Soft Manipulation*, 2016
4. \***Victor Emeli**, Alan R. Wagner, and Charles C. Kemp. A robotic system for autonomous medication and water delivery. Technical Report GT-IC-12-01, Georgia Institute of Technology, 2012
5. \***Victor Emeli**, Charles C. Kemp, and Mike Stilman. Push planning for object placement in clutter using the pr-2. In *IROS: The PR2 Workshop*, 2011
6. \*Tracy L. Mitzner, Cory-Ann Smarr, Jenay M. Beer, **Tiffany L. Chen**, Jennifer M. Springman, Akanksha Prakash, Charles C. Kemp, and Wendy A. Rogers. Older adults’ acceptance of assistive robots for the home. Technical Report HFA-TR-1105, Georgia Institute of Technology, School of Psychology, Human Factors and Aging Laboratory, 2011
7. \***Zhengqin Fan, Chih-Hung King, Hamza Darb**, and Charles C. Kemp. Dusty: A teleoperated assistive mobile manipulator that retrieves objects from the floor. In *Second Quality of Life Technology Symposium*, 2010
8. \***Advait Jain** and Charles C. Kemp. Behavior-based door opening with equilibrium point control. In *RSS workshop: Mobile Manipulation in Human Environments*, June 2009
9. \***Young Sang Choi, Cressel Anderson, Travis Deyle**, and Charles C. Kemp. Human-robot interaction studies for autonomous mobile manipulation for the motor impaired. In *Technical Report SS-09-03: Papers from the AAAI Spring Symposium, “Experimental Design for Real-World Systems”*. AAAI, March 2009
10. \***Young Sang Choi, Travis Deyle**, and Charles C. Kemp. A list of household objects for robotic retrieval prioritized by people with als. Technical Report 0902.2186v1, 2009
11. \*Charles C. Kemp. Practical challenges for developmental robotics. *IEEE CIS AMD Newsletter*, 5(2):3–4, October 2008
12. \***Cressel Anderson**, Ben Axelrod, J. Philip Case, Jaeil Choi, Martin Engel, Gaurav Gupta, Florian Hecht, John Hutchinson, Niyant Krishnamurthi, Jinhua Lee, **Hai Dai Nguyen**, Richard Roberts, John G. Rogers, **Alexander J. B. Trevor**, Henrik I. Christensen, and Charles C. Kemp. Mobile manipulation: a challenge in integration. In *Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series: Unmanned Systems Technology X*, volume 6962. SPIE, 2008
13. \*Charles C. Kemp. Three broad themes for testing machines. *IEEE CIS AMD Newsletter*, 4(1):6–7, April 2007

14. Charles C. Kemp. Wearables and robots: A shared view. *IEEE Pervasive Computing*, 5(3):16–20, July–September 2006
15. Charles C. Kemp and Aaron Edsinger. Visual tool tip detection and position estimation for robotic manipulation of unknown human tools. Technical Report AIM-2005-037, MIT Computer Science and Artificial Intelligence Laboratory (CSAIL), 2005
16. Charles C. Kemp. Duo: A wearable system that learns about everyday objects and actions. In *Proceedings of the Eighth International Symposium on Wearable Computers (ISWC)*, pages 182–183, October 2004

## D. Presentations

Abbreviation	Full
RSS	Robotics: Science and Systems Conference
IROS	IEEE/RSJ International Conference on Intelligent Robots and Systems
AAAI	Association for the Advancement of Artificial Intelligence
HRI	ACM/IEEE International Conference on Human-Robot Interaction
ICRA	IEEE International Conference on Robotics and Automation
Humanoids	IEEE-RAS International Conference on Humanoid Robots
Ro-MAN	IEEE International Conference on Robot & Human Interactive Communication

### D.1. Invited Conference and Workshop Presentations

1. Charles C. Kemp, “Meet Stretch: Fireside Chat with Prof. Charlie Kemp from Hello Robot and Georgia Tech”, Ro-MAN Workshop: HRIpreneur, Virtual, September, 2020
2. Charles C. Kemp, Panelist with slides for a “Panel on Eldercare Opportunities for Robots”, Robots Unplugged, Virtual, April, 2020
3. Charles C. Kemp, “Mobile Manipulators for Personalized Caregiving”, Healthcare Robotics Engineering Forum, Santa Clara, CA, December, 2019
4. Charles C. Kemp, “Mobile Manipulators for Intelligent Physical Assistance”, IROS Workshop: Robots for Assisted Living Workshop, Madrid, Spain, October, 2018
5. Charles C. Kemp, “Mobile Manipulators for Intelligent Physical Assistance”, International Symposium on Medical Robotics (ISMR), Atlanta, GA, March, 2018
6. Charles C. Kemp, “Mobile Manipulators for Intelligent Physical Assistance”, American Congress of Rehabilitation Medicine (ACRM), Session: Emerging Technologies for Stroke Rehabilitation: Toys or Tools?, Atlanta, GA, October, 2017
7. Charles C. Kemp, “Haptic Sensing for Assistive Robots”, RSS Workshop: Tactile Sensing for Manipulation: Hardware, Modeling, and Learning, Cambridge, MA, July, 2017
8. Charles C. Kemp, “Mobile Manipulators for Intelligent Physical Assistance”, RSS Workshop: Human-Centered Robotics: Interaction, Physiological Integration and Autonomy, Cambridge, MA, July, 2017
9. Charles C. Kemp, “Multimodal Sensing for Assistive Robots”, AAAI Symposium: Interactive Multi-Sensory Object Perception for Embodied Agents, Stanford, CA, March, 2017
10. Charles C. Kemp, “Haptic Sensing for Assistive Robots”, Humanoids Workshop: Tactile sensing for manipulation: new progress and challenges, Cancun, Mexico, November, 2016

11. Charles C. Kemp, IROS Workshop: Assistive Robotics for Individuals with Disabilities: HRI Issues and Beyond, Chicago, IL, September, 2014
12. Charles C. Kemp, "Manipulation in Clutter with Whole-Arm Tactile Sensing", International Symposium of Robotics Research (ISRR), Singapore, December, 2013
13. Charles C. Kemp, "Assistive Mobile Manipulation for People with Motor Impairments: The Benefits of Touch", Humanoids Workshop: From Safety to Comfort in the Humanoid Coworker and Assistant, Atlanta, GA, October, 2013
14. Charles C. Kemp, HRI Workshop: Collaborative Manipulation, Tokyo, Japan, March, 2013
15. Charles C. Kemp, "Assistive Mobile Manipulation for People with Motor Impairments", 1st Piper Health Solutions Workshop on Rehabilitation Robotics at ASU, Phoenix, Arizona, February, 2013
16. Charles C. Kemp, "Mobile Manipulation for Healthcare", Early Career Spotlight talk at Robotics: Science and Systems (RSS), Sydney, NSW, Australia, July, 2012
17. Charles C. Kemp, "Manipulation in Clutter with Whole-arm Tactile Sensing", RSS Workshop: Robots in Clutter, Sydney, NSW, Australia, July, 2012
18. Charles C. Kemp, IEEE Workshop on Advanced Robotics and its Social Impacts (ARSO), Half-Moon Bay, CA, October, 2011
19. Charles C. Kemp, IROS Workshop: The PR2 Workshop, San Francisco, CA, September, 2011
20. Charles C. Kemp, "RFID Object Search in the Real World: an Optimization-Based Approach", IROS Workshop: Active Semantic Perception and Object Search in the Real World, San Francisco, CA, September, 2011
21. Charles C. Kemp, IROS Workshop: Knowledge Representation for Autonomous Robots, San Francisco, CA, September, 2011
22. Charles C. Kemp, "Mobile Manipulation for Healthcare", State of the Science Conference on Workplace Accommodations, Bethesda, Maryland, April, 2011
23. Charles C. Kemp, "Autonomous Mobile Manipulation for Healthcare", Learning, Planning and Sharing Robot Knowledge for HRI, Dagstuhl Castle, Germany, October, 2010
24. Charles C. Kemp, "Assistive Mobile Manipulation for Older Adults at Home", PR2 Beta Program Workshop, Menlo Park, CA, May, 2010
25. Charles C. Kemp, "Autonomous Mobile Manipulation for Healthcare", ICRA Workshop: Mobile Manipulation, Anchorage, Alaska, May, 2010
26. Charles C. Kemp, "Cognitive Systems for the Real World", Third Interlink-Workshop on Intelligent Cognitive Systems, Santa Monica, CA, September, 2008
27. Charles C. Kemp, "Challenge Tasks for Autonomous Mobile Manipulation", AAAI Workshop: Mobility and Manipulation, Chicago, IL, July, 2008
28. Charles C. Kemp, Advancing Robotics Technology for Societal Impact (ARTSI) Faculty Summer Workshop, Pittsburgh, PA, August, 2008
29. Charles C. Kemp, "Autonomous Mobile Manipulation for Healthcare", Robotics@Intel: Personal Robotics and Mobile Manipulation Workshop, Intel Headquarters, Santa Clara, CA, June, 2008
30. Charles C. Kemp, "How much can robots do for us without learning and developing?", International Conference on Development and Learning (ICDL), London, UK, July, 2007

## **D.2. Conference and Workshop Presentations**

1. Charles C. Kemp, “Dusty: A Teleoperated Assistive Mobile Manipulator that Retrieves Objects from the Floor”, Second International Symposium on Quality of Life Technology, Las Vegas, NV, June, 2010
2. Charles C. Kemp, “Bio-inspired Assistive Robotics: Service Dogs as a Model for Human-Robot Interaction and Mobile Manipulation”, International Conference on Biomedical Robotics and Biomechanics (BioRob), Scottsdale, Arizona, October, 2008
3. Charles C. Kemp, “El-E: An Assistive Robot that Fetches Objects from Flat Surfaces”, HRI: Workshop on Helper Robots, Amsterdam, The Netherlands, March, 2008
4. Charles C. Kemp, Sixth International Conference on Epigenetic Robotics, Paris, France, September, 2006
5. Charles C. Kemp, International Conference on Development and Learning (ICDL), Bloomington, IN, June, 2006
6. Charles C. Kemp, “Tooltip Detection for Robot Manipulation”, NASA Kennedy Space Center, Cape Canaveral, Florida, 2006
7. Charles C. Kemp, “pysense: Humanoid Robots, a Wearable System, and Python”, PyCon2006, Dallas, TX, February, 2006
8. Charles C. Kemp, RSS Workshop : Humanoid Manipulation, Cambridge, Massachusetts, June, 2005
9. Charles C. Kemp, “Duo: Towards a Wearable System that Learns about Everyday Objects and Action”, IEEE International Symposium on Wearable Computers, Arlington, VA, Oct. – Nov., 2004
10. Charles C. Kemp, “Shoes as a Platform for Vision”, IEEE International Symposium on Wearable Computers, White Plains, NY, October, 2003
11. Charles C. Kemp, IEEE International Conference on Humanoid Robots, Karlsruhe-Munich, Germany, October, 2003
12. Charles C. Kemp, DARPA Omni LifeLog Workshop, 2002
13. Charles C. Kemp, “An Ontogenetic Perspective to Scaling Sensorimotor Intelligence”, AAAI Fall Symposium: Embodied Cognition and Action, Cambridge, Massachusetts, November, 1996

## **D.3. Invited Seminar Presentations**

1. Charles C. Kemp, “Mobile Manipulators for Intelligent Physical Assistance”, MIT Robotics Seminar, Cambridge, MA, November, 2017
2. Charles C. Kemp, “Mobile Manipulators for Intelligent Physical Assistance”, University of Washington Robotics Colloquium, Seattle, WA, May, 2017
3. Charles C. Kemp, “Autonomous Mobile Robots for Caregiving”, Park Springs Retirement Community by invitation of Prof. Robert M. Nerem, Stone Mountain, GA, October, 2015
4. Charles C. Kemp, “Autonomous Mobile Robots for Personalized Caregiving”, Wesley Woods Interactive Health Seminar for older adults and individuals with Parkinson’s disease, Atlanta, GA, April, 2015
5. Henry Evans and Charles C. Kemp, Kinross Wolaroi School (KWS) Speech Day in Australia, virtual attendance via Skype, December, 2014



6. Charles C. Kemp, "Autonomous Mobile Robots for Personalized Caregiving", Morehouse School of Medicine, Rehabilitative and Regenerative Medicine for Minority Health and Health Disparities (REMEDY), Atlanta, GA, June, 2014
7. Charles C. Kemp, "Autonomous Mobile Robots for Personalized Assistance", CCC / NSF Visions 2025: Interactions workshop, Washington DC, May, 2014
8. Charles C. Kemp, "Autonomous Mobile Robots for Personal Assistance", American Institute for Medical and Biological Engineering (AIMBE) Annual Meeting, Arlington, VA, March, 2014
9. Charles C. Kemp, "Mobile Manipulation for Healthcare", Atlanta Chapter of the IEEE Engineering in Medicine and Biology Society (EMBS), Atlanta, GA, January, 2013
10. Charles C. Kemp, Cornell Computer Science fall colloquium, Ithaca, NY, February, 2012
11. Charles C. Kemp, "An Assistive Robot to Fetch Everyday Objects for People with Severe Motor Impairments", Coulter Foundation, Fort Lauderdale, Florida, January, 2010
12. Charles C. Kemp, TU Munich, Germany, October, 2010
13. Charles C. Kemp, "Autonomous Mobile Manipulation for the Motor Impaired", CMU: Robotics Institute Seminar, October, 2008
14. Charles C. Kemp, "Autonomous Robot Manipulation for Healthcare", University of Cambridge, Daniel Wolpert's lab, Cambridge, UK, July, 2007

#### **D.4. Other Presentations**

##### **Presentations at Georgia Tech**

1. Charles C. Kemp, Research talk in Cohesive Collaborations 1: Biomechanics session at BME faculty retreat, Virtual, August, 2020
2. Charles C. Kemp, "The Ongoing Adventures of Charlie Kemp, Faculty Entrepreneur", Entrepreneurship talk in Faculty Entrepreneurship session at BME faculty retreat, Atlanta, GA, August, 2019
3. Charles C. Kemp, Panelist for Institute for Robotics and Intelligent Machines (IRIM) Research Showcase, Atlanta, GA, March, 2019
4. Charles C. Kemp, "Mobile Manipulators for Intelligent Physical Assistance", SURE Robotics REU research seminar, Atlanta, GA, June, 2019
5. Charles C. Kemp, "Mobile Manipulators for Intelligent Physical Assistance", SURE Robotics REU research seminar, Atlanta, GA, July, 2018
6. Charles C. Kemp, "Five Teaching Suggestions in Five Minutes", Lightning talk on teaching at BME faculty meeting, Atlanta, GA, May, 2017
7. Charles C. Kemp, "The Healthcare Robotics Lab", Lightning talk for the first Georgia Center for Medical Robotics meeting, Atlanta, GA, October, 2016
8. Charles C. Kemp, "The Healthcare Robotics Lab", Lightning talk for the Institute for Robotics and Intelligent Machines (IRIM) kickoff meeting, Atlanta, GA, September, 2016
9. Charles C. Kemp, "Autonomous Mobile Robots for Caregiving", SURE Robotics REU research seminar, Atlanta, GA, July, 2016

10. Charles C. Kemp, panelist along with professors Joe Le Doux and Ross Ethier for the BME Student Advisory Board's (bmedSAB) Town Hall on Innovation in Teaching, Atlanta, GA, April, 2016
11. Henrik Christensen, Magnus Egerstedt, and Charles C. Kemp, "Robotics@GT", To the Georgia Tech Foundation (GTF) and Georgia Tech President George P. "Bud" Peterson , Atlanta, GA, March, 2016
12. Charles C. Kemp, "Helpful Nonhumans with a Gentle Touch", Innovation and Collaboration in Lib-erals Arts, Science, and Technology (ICLAST), Atlanta, GA, October, 2015
13. Charles C. Kemp, "The Healthcare Robotics Lab @ Georgia Tech: 3 Things We've Learned After 8 Years", Talk for the Institute for Robotics and Intelligent Machines (IRIM) advisory board, Atlanta, GA, August, 2015
14. Charles C. Kemp, "The Healthcare Robotics Lab @ Georgia Tech: Intelligent Mobile Robots for Health-related Physical Assistance", KIST and GT Workshop, Atlanta GA, October, 2015
15. Charles C. Kemp, "Autonomous Mobile Robots for Personalized Caregiving", Petit Institute Breakfast Club, Atlanta GA, August, 2014
16. Charles C. Kemp, "Autonomous Mobile Robots for Personal Assistance", SURE Robotics REU research seminar, Atlanta, GA, June, 2014
17. Charles C. Kemp, "Assistive Mobile Manipulation for People with Motor Impairments", SURE REU research seminar, Atlanta, GA, July, 2013
18. Charles C. Kemp, "Robotic Assistance in Healthcare", Southern Society for Clinical Surgeons Meeting, April, 2012
19. Charles C. Kemp, Georgia Tech Homecoming Talk for Alumni, Atlanta, GA, October, 2011
20. Charles C. Kemp, "Mobile Manipulation for Healthcare", TRIBES-GTRI Workshop, Atlanta, GA, March, 2011
21. Charles C. Kemp, Family Weekend Talk for BME, Atlanta, GA, September, 2010
22. Charles C. Kemp, GVU Brown Bag Lecture, Atlanta, GA, November, 2010
23. Charles C. Kemp, "Autonomous Mobile Manipulation for the Motor Impaired", Engineering Psychol-ogy Colloquium, Atlanta, GA, February, 2010
24. Charles C. Kemp, "The Healthcare Robotics Lab", RIM Center Talks for GT Development, Atlanta, GA, January, 2010
25. Charles C. Kemp, "The Georgia Tech PR2 Project: Assistive Mobile Manipulation for Older Adults at Home", GVU Brown Bag Lecture, Atlanta, GA, November, 2008
26. Charles C. Kemp, "Autonomous Mobile Manipulation for Healthcare", Deka and Dean Kamen Visit, Student Center Theater, Atlanta, GA, May, 2008
27. Charles C. Kemp, "The Healthcare Robotics Lab", talk for Dr. Fred Sanfilippo Executive Vice Presi-dent of Emory and CEO of the Woodruff Health Sciences Center, Atlanta, GA, November, 2007
28. Charles C. Kemp, Health Systems Student Symposium keynote presentation, Atlanta, GA, April, 2007

## **E. Other Scholarly and Creative Accomplishments**

Dr. Kemp co-founded Hello Robot Inc. in 2017 to commercialize research from his lab.

## **F. Societal and Policy Impacts**

### **F.1. Select Examples of Broader Impact and Outreach Activities**

2020	Commercial robot Stretch released based on licensed IP from Prof. Kemp's lab
2007 – 2019	Ad hoc lab tours for K through 12 students and parents
2010 – 2019	National Robotics Week tours for Atlanta area high school students organized by RIM/IRIM
2012	Robot demo (Dusty) at British Consulate Atlanta event
2010 – 2011	Hosted Dr. Mohamed Bellamine, a Fulbright Fellow from Tunisia, for 10 months
2011	Release of commercial robot (Meka M1) inspired by robot from Dr. Kemp's lab (Cody)
2011 – 2012	Design of lab robot EL-E influences hobbyist robots (e.g., Maxwell & Pi Robot)
2009 – 2010	Atlanta Abilities Expo (Assistive Technology Pavilion) Presentations and Demos
2010	Demonstration at the ALS Association of Georgia Educational Symposium

### **F.2. Select Media Coverage**

2020	IEEE Spectrum	"Ex-Google's Startup Comes Out of Stealth With Beautifully Simple, Clever Robot Design"
2019	Medgadget	"Augmented Reality System Lets Severely Disabled Operate Own Robots"
2019	AT Today Magazine	"Pioneering study finds that seeing through a robot's eyes could help improve the lives of those with motor impairments"
2018	ASME website	"Robot Helps People Get Dressed"
2018	Digital Trends	"You won't even need to dress yourself in the future – thanks to robots like this"
2016	IEEE Spectrum	"Robots With Warm Skin Know What They're Touching"
2014	CNET	"RFID helps robots locate objects"
2013	Reuters	"A sense of touch makes robots more human"
2013	The New York Times	"Researchers Put Sense of Touch in Reach for Robots"
2012	CBS Evening News	"New robots giving the disabled independence"
2011	ABC News	"Personal Robot Gives Paralyzed Man Daily Help"
2011	Slashdot	Touched by a robot (Cody) research
2011	PBS NOVA	Dr. Kemp and robot (PR2) delivery to older adult
2010	NPR	Robot (Cody) skin cleansing on "Wait Wait... Don't Tell Me!"
2010	CNN	Live demo of RFID-guided robot (PR2) delivery to Ali Velshi
2010	Inside the Black Box	Interview with Dr. Kemp on a WREK radio show
2009	Good Morning America	Robot (EL-E) capabilities based on service dogs
2009	Popular Mechanics	Robot (EL-E) capabilities based on service dogs
2008	Various	Robot (EL-E) 3rd biggest Georgia Tech story for the year
2008	The New York Times	Laser pointer controlled robot (EL-E)
2005	CNN	Interview & demo of wearable (thesis) on Dr. Sanjay Gupta's show
2003	Nationwide local news	Interview & demo of wearable (thesis) via Ivanhoe Productions

## **G. Other Professional Activities**

Co-founder and Chief Technology Officer (CTO) at Hello Robot

## V. Education

### A. Courses Taught

List of courses taught at Georgia Tech since 2013.

Semester	Year	Course Number	Course Title	Number of Students
Fall	2020	BMED 2250	Problems in Biomed. Eng.	18
Spring	2020	BMED 4803/8813	Robotic Caregivers	8
Spring	2017	BMED 3400	Intro to Biomechanics	43
Fall	2016	BMED 2250	Problems in Biomed. Eng.	45
Spring	2016	BMED 3400	Intro to Biomechanics	50
Fall	2015	BMED 3400	Intro to Biomechanics	45
Spring	2015	BMED 3400	Intro to Biomechanics	58
Fall	2014	BMED 3400	Intro to Biomechanics	53
Spring	2014	BMED 3400	Intro to Biomechanics	50
Fall	2013	BMED 3400	Intro to Biomechanics	65
Spring	2013	BMED 3400	Intro to Biomechanics	72

### B. Individual Student Guidance

Abbreviation	Full
AP	School of Applied Physiology
ARTSI	NSF Advancing Robotics Technology for Societal Impact Program
BME	Department of Biomedical Engineering
ChBE	School of Chemical and Biomolecular Engineering
ECE	School of Electrical and Computer Engineering
EP	School of Psychology, Engineering Psychology PhD Program
CoC	College of Computing
HSI	Health Systems Institute
IC	School of Interactive Computing
ISyE	School of Industrial and Systems Engineering
ME	School of Mechanical Engineering
SURE	NSF REU Summer Undergraduate Research in Engineering Program

#### B.1. Ph.D. Students

##### Graduated Ph.D. Students

###### 1. Ariel Kapusta

Graduated with PhD in 2018

Thesis: Task-centric optimization for assistive mobile manipulators

Current position: Robotics Engineer at ENWAY (robotics startup in Berlin)

Advising period: spring 2013 – June 2018

Mechanical Engineering (ME) home school, Robotics PhD program

###### 2. Daehyung Park

Graduated with PhD in 2018

Thesis: A Multimodal Execution Monitor for Assistive Robots

Current position: assistant professor at KAIST in the School of Computing

Advising period: fall 2012 – March 2018

Interactive Computing (IC) home school, Robotics PhD program

3. **Phillip M. Grice**  
Graduated with PhD in 2017  
Thesis: Assistive Mobile Manipulation for Users with Severe Motor Impairments  
Current position: Robotics Scientist at Bossa Nova Robotics (robotics startup)  
NSF Graduate Research Fellow (2012-2015)  
Advising period: fall 2010 – August 2017  
Biomedical Engineering (BME) home school, Robotics PhD program
4. **Tapomayukh Bhattacharjee**  
Graduated with PhD in 2017  
Thesis: Rapid Haptic Perception using Force and Thermal Sensing  
Current position: Postdoctoral Researcher at the University of Washington  
Fall 2021: assistant professor at Cornell in the Department of Computer Science  
Advising period: fall 2011 – August 2017  
Biomedical Engineering (BME) home school, Robotics PhD program
5. **Tiffany Chen**  
Graduated with PhD in 2014  
Thesis: Haptic Interaction Between Naive Participants and Mobile Manipulators in the Context of Healthcare  
Current position: Manager, Human Machine Interaction Research, Toyota Research Institute (TRI)  
NSF Graduate Research Fellow (2009-2012)  
Advising period: fall 2008 – April 2014  
Biomedical Engineering (BME) home school, Robotics PhD program
6. **Hai Nguyen**  
Graduated with PhD in winter 2013  
Thesis: Constructing Mobile Manipulation Behaviors Using Expert Interfaces and Autonomous Robot Learning  
Current position: Software Engineer at Aurora (autonomous driving startup)  
Previous position: First employee at Mayfield Robotics (robotics startup)  
Advising period: fall 2007 – November 2013  
Interactive Computing (IC) home school, Robotics PhD program
7. **Marc Killpack**  
Graduated with PhD in winter 2013  
Thesis: Model Predictive Control with Haptic Feedback for Robot Manipulation in Cluttered Scenarios  
Current position: Associate professor with tenure in the Department of Mechanical Engineering at Brigham Young University (BYU)  
Advising period: summer 2009 – November 2013  
Mechanical Engineering (ME) home school, Robotics PhD program
8. **Advait Jain**  
Successfully defended dissertation on July 20, 2012  
Thesis: Mobile Manipulation in Unstructured Environments with Haptic Sensing and Compliant Joints  
Current position: Google (Co-founder of Redwood Robotics acquired by Google)  
TI:GER Fellow (2010-2012)  
Advising period: fall 2007 – summer 2012  
Interactive Computing (IC) home school, Robotics PhD program
9. **Travis Deyle**  
Graduated with PhD in winter 2011

Thesis: Ultra High Frequency (UHF) Radio-Frequency Identification (RFID) for Robot Perception and Mobile Manipulation

Current position: Co-founder and CEO of Cobalt Robotics (robotics startup)

NSF Graduate Research Fellow (2007-2010)

Advising period: fall 2007 – fall 2011

Electrical and Computer Engineering (ECE) home school, ECE PhD program

10. **Young Sang Choi**

Graduated with PhD in summer 2009

Thesis: A Study of Human-Robot Interaction with an Assistive Robot to Help People with Severe Motor Impairments

Current position: Vice President, Samsung Advanced Institute of Technology

Advising period: spring 2008 – summer 2009

Industrial and Systems Engineering (ISyE) home school, ISyE PhD program

**In Process Ph.D. Students**

1. **Henry M. Clever**

Advising period: fall 2016 – present

NSF Fellow, NSF NRT Fellow, Georgia Tech President’s Fellowship

Fully qualified and successfully proposed

Biomedical Engineering (BME) home school, Robotics PhD program

2. **Zackory Erickson**

Advising period: fall 2016 – present

Georgia Tech President’s Fellowship

Fully qualified and preparing dissertation proposal

Electrical and Computer Engineering (ECE) home school, Robotics PhD program

3. **Patrick Grady**

Advising period: fall 2019 – present

Fully qualified

Electrical and Computer Engineering (ECE) home school, Robotics PhD program

**B.2. M.S. Students (Indicate Thesis Option for Each Student)**

**Previous M.S. Students**

1.	Joshua Wade	2016 – 2017	ME	Thesis: “A Force and Thermal Sensing Skin for Robots in Human Environments”
2.	Ashwin A. Shenoi	2014 – 2016	ECE	Thesis: “A CRF that Combines Tactile Sensing and Vision for Haptic Mapping”
3.	Kevin Chow	2012 – 2016	ME	
4.	Newton K. Chan	2015 – 2016	ME	
5.	Jeffrey Hawke	2012 – 2013	ME	
6.	Kelsey Hawkins	2010 – 2012	CoC	
7.	Jason Okerman	2010 – 2011	ECE	
8.	Zhengqin Fan	2009 – 2010	AP	
9.	Martin Schuster	2009 – 2010	CoC	
10.	Jae Wook Yoo	2009	CoC	
11.	Aaron Bozorg	2009	CoC	
12.	Abhishek Bhatkhande	2009	ISyE	
13.	Guilain Bohineust	2009	CoC	

- |     |                  |             |     |
|-----|------------------|-------------|-----|
| 14. | Zhe “Joseph” Xu  | 2007 – 2008 | HSI |
| 15. | Cressel Anderson | 2007 – 2009 | ECE |

### In Process M.S. Students

- |    |                   |                     |     |
|----|-------------------|---------------------|-----|
| 1. | Pratyusha Karnati | fall 2020 – present | CoC |
| 2. | Yijun “Esther” Gu | fall 2019 – present | CoC |

### B.3. Undergraduate Students

- |     |                        |             |            |
|-----|------------------------|-------------|------------|
| 1.  | Brenna Fankell         | summer 2019 | SURE       |
| 2.  | Eliot Xing             | 2017 – 2020 | ECE        |
| 3.  | Holden Schaffer        | 2018 – 2020 | CoC        |
| 4.  | Bharat Srirangam       | 2018 – 2020 | CoC        |
| 5.  | Vamsee Gangaram        | 2017 – 2020 | CoC        |
| 6.  | Katie Sosnowski        | summer 2018 | SURE       |
| 7.  | Mallak Taleb           | summer 2018 | SURE       |
| 8.  | Ho Keun Kim            | 2016 – 2017 | BME        |
| 9.  | Haoping “Felix” Bai    | 2016 – 2018 | CoC & ME   |
| 10. | Haofeng “Alex” Chen    | 2016 – 2018 | CoC & ME   |
| 11. | Austin Jang            | 2017        | CoC        |
| 12. | Yuuna Hoshi            | 2016 – 2018 | ME         |
| 13. | Nathan Luskey          | 2017 – 2018 | BME        |
| 14. | Ryan Williams          | 2017        | ME         |
| 15. | Rohith Krishnan        | 2016 – 2017 | CoC        |
| 16. | Maggie Collier         | summer 2017 | SURE       |
| 17. | Chansu Kim             | 2016        | BME        |
| 18. | Linda Komnang Liezu    | summer 2016 | SURE       |
| 19. | Hyder Hasnain          | spring 2015 | BME        |
| 20. | Zackory Erickson       | summer 2015 | SURE       |
| 21. | Megan Rich             | summer 2014 | BME        |
| 22. | Joshua C. Wade         | 2013 – 2016 | ME         |
| 23. | You-Keun Kim           | spring 2013 | BME        |
| 24. | Christopher Birmingham | summer 2014 | SURE       |
| 25. | Caleb Little           | summer 2014 | SURE       |
| 26. | Connor Eaton           | 2013 – 2014 | BME        |
| 27. | Yen Huang              | 2013 – 2014 | BME        |
| 28. | Inez Raharjo           | 2013 – 2014 | BME        |
| 29. | Jacquelyn Borinski     | 2013 – 2014 | BME        |
| 30. | Sarvagya Vaish         | 2012 – 2013 | ECE        |
| 31. | Anjana Kallarackal     | 2012        | BME        |
| 32. | Ishwarya Venkatachalam | 2011 – 2012 | CoC        |
| 33. | Jasmine Lawrence       | 2012        | CoC        |
| 34. | Ahalya Prabhakar       | summer 2012 | Caltech ME |
| 35. | Fang Qi                | 2012        | BME        |
| 36. | Akhil Kumar            | 2012        | BME        |
| 37. | Joel Mathew            | 2010 – 2011 | ME         |
| 38. | Kayode Sanni           | summer 2011 | SURE       |
| 39. | Mrinal “Neil” Rath     | 2009 – 2011 | BME        |
| 40. | Kristina Falkenstrom   | 2009 – 2010 | BME        |
| 41. | Alex McNeely           | 2009 & 2010 | ARTSI      |

42.	Aakanksha Gupta	2009	BME
43.	Christopher Romano	summer 2009	ChBE
44.	Hamza Darb	summer 2009	BME
45.	Ian Guthridge	2008	CoC
46.	Khang Nguyen	2008	BME
47.	Carlos Torres	summer 2008	SURE
48.	Sugandha Arora	summer 2008	SURE

#### B.4. Service on Thesis or Dissertation Committees

##### Internal

<i>Year</i>	<i>Student</i>	<i>Advisor(s)</i>	<i>School</i>
2020	Samarth Brahmhatt	James Hays	IC
2020	Wenhao Yu	Greg Turk & Karen Liu	IC
2019	Alexander Clegg	Karen Liu & Greg Turk	IC
2017	Vivian Chu	Andrea Thomaz & Sonia Chernova	IC
2016	Ana Huamán Quispe	Henrik Christensen	IC
2014	Tucker Hermans	Aaron Bobick & James Rehg	IC
2013	Jenay Beer	Dan Fisk	EP
2013	Katherine Olson	Dan Fisk	EP
2012	Douglas Brooks	Ayanna Howard	ECE
2009	Sekou Remy	Ayanna Howard	ECE
2008	Leanne Metcalfe	Brani Vidakovic	BME
2007	Shane Migliore	Steve DeWeerth	ECE

#### B.5. Mentorship of Postdoctoral Fellows or Visiting Scholars

##### Postdoctoral Fellows

##### 1. Chih Hung “Aaron” King

Advising period: summer 2009 – February 2012

Postdoctoral Researcher

##### Visiting Scholars

##### 1. Mohamed Sahbi Bellamine, Ph.D.

Advising period: 2010 – 2011 (10 months)

Fulbright Fellow from Tunisia

### C. Educational Innovations and Other Contributions

#### Course Development

##### ◇ BMED 4803/8813 : Robotic Caregivers (spring 2020)

Dr. Kemp co-developed this new course with his PhD student Zackory Erickson. Graduate students and undergraduates from multiple disciplines (e.g., biomedical engineering and computing) teamed up for robot projects in simulation. Robotics researchers and futurists have long dreamed of robots that can serve as caregivers. In this hands-on project-based course, students learn about future opportunities and present realities for autonomous robots that serve as caregivers. All materials are open and online.



- ◇ **BMED 8813 : Haptic Manipulation in Biology and Robotics] (fall 2011)**  
Dr. Kemp developed this new graduate course that focuses on the role of haptic sensing during biological manipulation, and how principles of haptic manipulation from biology can be applied to robotics.
- ◇ **4632B/8803 : Advanced Intelligent Robotics – Mobile Manipulation] (spring 2007)**  
Dr. Kemp co-developed this new graduate course with Henrik Christensen. Developed and presented lectures, and advised students on projects. Students used a mobile manipulator to prepare and serve coffee.

### Course Improvement

- ◇ **BMED 3400 : Introduction to Biomechanics**  
Dr. Kemp entirely revised the course and course materials, which he has made open. Over the 13 terms he taught the course student satisfaction as estimated via course surveys dramatically improved and resulted in Dr. Kemp receiving a teaching award.

### Guest Lectures

2018	CS 8803 : Mobile Manipulation
2014, 2015	DPT 988 at Emory : Interfacing Engineering Technology and Rehabilitation
2014	BMED 7002 : Teaching Practicum
2011, 2012, 2013	ROB 7785 : Intro to Robotics
2010	BMED 4400 : Neuroengineering Fundamentals
2010	CS 3630 : IPR – Introduction to Perception and Robotics
2009	CS 3600 : Introduction to Artificial Intelligence
2007	HS 6300 : Health Systems Information Technology

## VI. Service

### A. Professional Contributions

#### A.1. Society Offices, Activities, and Membership

Institute of Electrical and Electronics Engineers (IEEE) Member  
Association for Computing Machinery (ACM) Lifetime Member

#### A.2. Organization and Chairmanship of Technical Sessions, Workshops and Conferences

2013	Tour Co-Chair	IEEE-RAS International Conference on Humanoid Robots
2009, 2010	Associate Editor	IEEE International Conference on Robotics and Automation (ICRA)
2008-2011	Editorial Board	International Journal of Human-Computer Interaction (IJHCI)
2009	Guest Editor	Autonomous Robots, Special Issue on Autonomous Mobile Manipulation
2008	Publicity Chair	International Conference on Development and Learning (ICDL)
2008	Workshop Chair	Robotics: Science and Systems Conference (RSS)
2008	Co-Organizer	RSS Manipulation Workshop: Intelligence in Human Environments
2007	Lead Organizer	RSS Manipulation Workshop: Sensing and Adapting to the Real World
2006	Lead Organizer	RSS Workshop: Manipulation for Human Environments

### A.3. Technical Journal or Conference Referee Activities

#### Canada

2009 Canada Foundation for Innovation (CFI), Leaders Opportunity Fund (LOF)

#### Conferences

2008, 2010, 2013, 2014, 2017 International Conference on Robotics and Automation (ICRA)  
2007-2009, 2014, 2016 International Conference on Intelligent Robots and Systems (IROS)  
2012 IEEE-RAS International Conference on Humanoid Robots (Humanoids)  
2012 IEEE World Haptics Conference (WHC)  
2011 Proceedings of the IEEE  
2009-2010 ACM Conference on Human Factors in Computing Systems (CHI)  
2009 RSS Workshop: Mobile Manipulation in Human Environments  
2009 IEEE International Conference on Rehabilitation Robotics (ICORR)  
2009 IEEE/ASME International Conference on Advanced Intelligent Mechatronics  
2008-2009 ACM/IEEE International Conference on Human-Robot Interaction (HRI)

#### Journals

2007-2008, 2011-2014 The International Journal of Robotics Research (IJRR)  
2012 Transactions on Haptics  
2006-2007, 2012 Robotics & Automation Magazine  
2011 Proceedings of the IEEE  
2008-2010 IEEE Transactions on Robotics (TRO)  
2009, 2010 Intelligent Service Robotics  
2008, 2010 IEEE Transactions on Systems, Man, and Cybernetics  
2006-2009 International Journal of Human-Computer Interaction (IJHCI)  
2008-2009 Interaction Studies  
2009 International Journal of Social Robotics (IJSR)  
2006-2007 International Journal of Humanoid Robotics (IJHR)

### A.4. Proposal Panels and Reviews

#### NSF

2012 Panel Washington DC  
2011 Adhoc  
2009 Panel Washington DC  
2008 Panel Washington DC  
2008 Adhoc

#### EU

2011 & 2012 Served on three person panel for 3rd and 4th year reviews of DEXMART, an FP7 large scale integrating project (8.12 million euro) with 8 institutions involved. Reviews were held at DLR and at the Karlsruhe Institute of Technology.

2009 External Reviewer for Mario Prats Sanchez's Doctoral Thesis at Jaume I University, Castellón de la Plana, Spain (His thesis won the Georges Giralt PhD Award).

## Canada

2009 Canada Foundation for Innovation (CFI), Leaders Opportunity Fund (LOF)

### A.5. Other Involvement

2012 US Service Robotics Roadmapping Workshop (held at UW)

2012 US Medical and Healthcare Robotics Roadmapping Workshop (held at USC)

2008 CRA/CCC Roadmapping for Robotics Workshop: Domestic and Professional Service Robotics

## B. Public and Community Service

◇ Prof. Kemp and his student, Henry M. Clever, invented a new kind of mobile manipulator in 2016-2017 to address a lack of available robots suitable for real-world physical assistance. Prof. Kemp co-founded Hello Robot in 2017 to commercialize this robot. In 2020, Hello Robot released open source code and began selling a capable and affordable research robot designed and assembled in the United States that are now being used by university and industry researchers across the United States.

◇ Prof. Kemp's lab has also released open hardware, open source code, and open data to support the broader community. For example, in 2020 Prof. Kemp's lab released Assistive Gym, an open source physics simulation system for assistive robots that supports reinforcement learning that is being used at Stanford, Berkeley, and Carnegie Mellon University (CMU). The class BMED 4803/8813 : Robotic Caregivers that Prof. Kemp developed with Zackory Erickson, his student, also uses Assistive Gym.

## C. Institute Contributions

### C.1. Institute Committee Service

2007 – 2016 Robotics PhD Program Committee

### C.2. School Committee Service

2020 – present	Awards Committee
2019 – 2020	Biomedical Robotics TFA Chair
2012 – 2017, 2019-2020	Undergraduate Committee
2009 – 2013	BME Young Innovator Speaker Series Selection Committee
2007 – 2014	BME Admissions Committee

### C.3. Program Development: Research

2013 – present	Institute for Robotics and Intelligent Machines (IRIM)
2006 – 2013	Center for Robotics and Intelligent Machines (RIM)
2016 – present	The Georgia Center for Medical Robotics (GCMR)
2011 – present	Institute for People and Technology (IPaT)
2006 – 2013	Health Systems Institute (HSI)

#### **C.4. Program Development: Academic**

2017                      Represented BME in Robotic Minor approval process  
2007 – present      Robotics PhD Program

#### **C.5. Other Institute Service Contributions**

2016                      BME Retreat Organizer  
2016-2017      Founding Faculty Advisor for the undergraduate club, BME Robotics, which was later  
renamed the Medical Robotics Club