

# Jake O. Huckaby

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## Education

Ph.D. Robotics, Georgia Institute of Technology, 2014

*Thesis title: Knowledge Transfer in Robot Manipulation Tasks*

*Advisor: Henrik Christensen*

M.S. Electrical Engineering, Georgia Institute of Technology, 2013

B.S. Electrical Engineering, Brigham Young University, 2008

## Research Fields of Interest

Knowledge Systems in Robotics, Robotics Education, Human-Robot Interaction, Mobile Manipulation, Mobile Robotics, Applications in Industrial Automation

## Related Experience

### **Vice President of Strategic Initiatives, READY Robotics, 2017 - present**

Responsibilities include:

- Spearhead various strategic research initiatives
- Work with engineering and end-users to create product development roadmap
- Develop software for real-time control of robot systems
- Define educational requirements and engagement strategy with educational institutions
- Coordinate product management, product design, customer support and customer success efforts
- Create and execute partnership, marketing, and sales strategy
- Serve on national and international standards committees for robot safety

### **Senior Robotics Research Engineer, Energid Technologies, 2015 - 2017**

Responsibilities included:

- Develop software for simulation and real-time control of robot systems
- Create and execute development, marketing, and sales strategy for Energid's flagship software
- Work with potential partners and customers on various business development opportunities
- Manage relationships with sales and distribution partners
- Represent Energid in development of national and international safety standards for industrial and collaborative robot systems

### **Technical Manager, Universal Robots USA, Inc., 2014 - 2015**

Responsibilities included:

- Collaborate in various internal development projects
- Design and implement educational curricula for UR robots
- Assist in development of complex integrated robot system applications
- Participate in international ISO safety standard development for industrial robots

**Graduate Research Assistant, Cognitive Robotics Lab, Georgia Tech, 2008 - 2014**

Research areas:

- taxonomy-based task modeling for industrial tasks
- learning by demonstration techniques in industrial manufacturing
- low degree-of-freedom manipulation for domestic service robots
- door opening strategies for high- and low- DOF robots
- dynamic characterization of advanced manipulator for industrial tasks
- designing a real-time interface for a prototype manipulator controller

**Team Member, Georgia Tech RoboCup@Home Team, 2009 - 2010**

Collaborated with lab members to design and program a robot to participate in the 2010 RoboCup@Home competition in Singapore

**Robot Choreographer, Georgia Institute of Technology, 2009**

Designed robot choreography for short film and Emmy Award-winning television commercial

**Technical Assistant, Georgia Institute of Technology, 2008**

Assisted in administering the first series of workshops bringing together thought leaders in robotics from industry and academia to form the US Robotics Roadmap, presented to Congress by workshop organizer Henrik Christensen

**Robotics Engineer, Mega Engineering, 2008**

Worked for Mega Engineering, a NASA subcontractor under the Hubble Space Telescope (HST) project at the NASA-Goddard facility. Responsibilities included designing a 3D simulator for an industrial manipulator used for different simulated space scenarios, as well as implementing collision detection and error handling to the robot control software

**Group Leader, BYU DARPA Urban Challenge Team, Brigham Young University, 2007**

Undergraduate group leader for the team controls group, designing and implementing vehicle drive and correction control systems

**Research Assistant, Greg Nordin, 2006 - 2007**

Projects included low-loss optical fiber splicing, and optimal deposition recipes for silicon-on-quartz deposition for use in microcantilever array sensors

## Publications

### Book Chapters

1. Lynn Henriksen, George Bailey, Jacob Huckaby, "Dealing with the "Third Enemy": English-language Learning and Native-language Maintenance among Danish Immigrants in Utah, 1850-1930" pp. 62-91 in *Danish Culture, Past and Present: The Last Two Hundred Years, Proceedings of the International Conference of the Danish American Heritage Society*. Eds. Birgit Flemming Larsen and Linda Chimenti. Ames, Iowa: Danish American Heritage Society, 2006.

### Journals

1. Anyin Li, Martin R.L. Paine, Stephen Zambrzycki, Rachel B. Stryffeler, Jason Wu, Marcos Bouza, Jacob Huckaby, Chu-Yin Chang, Manoj Kumar, Piyoosh Mukhija, Facundo Fernández, "Robotic Surface Analysis Mass Spectrometry (RoSA-MS) of Three-Dimensional Objects", *Analytical Chemistry*, 2018
2. Rachel Bennet, Ezequiel Morzan, Jacob Huckaby, María Monge, Henrik Christensen, Facundo Fernández, "Robotic Plasma Probe Ionization Mass Spectrometry (ROPPI-MS) of Non-Planar Surfaces", *The Analyst*, 2014

3. Lynn Henriksen, George Bailey, Timothy Wright, John Brumbaugh, Jacob Huckaby, Ray LeBaron, "Building Community by Respecting Linguistic Diversity: Scandinavian Immigrants in Nineteenth-Century Utah." *Utah Historical Quarterly*, vol. 78, no. 1 (Winter 2010), pp. 4-22.
4. Lynn Henriksen, George Bailey, Jacob Huckaby, "Dealing with the "Third Enemy": English-language Learning and Native-language Maintenance among Danish Immigrants in Utah, 1850-1930," *The Bridge: Journal of the Danish American Heritage Society*, vol. 29, no. 2 (2006), pp. 62-91.

## Conferences

1. Kelleher Guerin, Luke Tuttle, Jacob Huckaby, "A Common Platform for Semantic Annotation of Manufacturing Data for Machine Learning", *2020 AAAI Spring Symposium on AI in Manufacturing*
2. Jacob Huckaby, Henrik I. Christensen, "A Case for SysML in Robotics", *IEEE International Conference on Automation Science and Engineering (CASE 2014)*
3. Jacob Huckaby, Henrik I. Christensen, "Skill Abstraction in Robot Manufacturing Tasks", *2014 International Symposium on Experimental Robotics (ISER 2014)*
4. Jacob Huckaby, Henrik I. Christensen, "Modeling Robot Assembly Tasks in Manufacturing Using SysML", *45th International Symposium on Robotics (ISR 2014)*
5. Jacob Huckaby, Stavros Vassos, Henrik I. Christensen, "Planning with a Task Modeling Framework in Manufacturing Robotics", *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2013)*
6. Jacob Huckaby, Henrik I. Christensen, "Learning by Demonstration in Industrial Tasks", *2011 Georgia Tech Research and Innovation Conference, 8 February 2011.*

## Workshops

1. Jacob Huckaby, Henrik I. Christensen, "Toward A Knowledge Transfer Framework for Process Abstraction in Manufacturing Robotics", *International Conference on Machine Learning 2013 workshop: Theoretically Grounded Transfer Learning, June 20, 2013, Atlanta, GA*
2. Jacob Huckaby, Henrik I. Christensen, "A Taxonomic Framework for Task Modeling and Knowledge Transfer in Manufacturing Robotics", *8th International Workshop on Cognitive Robotics, 2012*
3. Changhyun Choi, Jacob Huckaby, John G. Rogers III, Alexander J. B. Trevor, James P. Case, and Henrik I. Christensen, "Towards Semantic Perception for Mobile Manipulation," *IROS 2009 workshop: Semantic Perception for Mobile Manipulation, October 15, 2009, Hyatt Regency St. Louis Riverfront, St. Louis, USA.*

## Technical Reports

1. Jacob Huckaby, Carlos Nieto-Granda, John G. Rogers III, Alex J. B. Trevor, and Henrik I. Christensen, "Mobile Manipulation in Domestic Environments Using A Low Degree of Freedom Manipulator", *Georgia Institute of Technology Technical Report, GT-RIM-CR-2012-002, October 2012.*
2. Jacob Huckaby, Henrik I. Christensen, "Dynamic Characterization of KUKA Light-Weight Robot Manipulators", *Georgia Institute of Technology Technical Report, GT-RIM-CR-2012-001, October 2012.*

## Teaching

Principles of Robot Safety in Industrial Automation

READY Academy, Fall 2020

*Instructor*

*Online course for robot safety principles and risk assessment training*

Principles of Robot Programming

eKentucky Advanced Manufacturing Institute, August 2020

*Instructor*

ECEn 483 - Linear Systems and Controls

Brigham Young University, Fall 2007

*Teaching Assistant for Randy Beard*

ECEn 380 - Signals and Systems

Brigham Young University, Spring 2007

*Teaching Assistant for Richard Christiansen*

Dan 101 - Introduction to Danish

Brigham Young University, Fall 2005

*Instructor*

## Professional Presentations

“Breaking Barriers to Automation - Innovative Advances that Ease Adoption of Robot Automation Technologies”, *The Vision Conference*, 9 April 2018 (Boston, Massachusetts)

“The Role of Simulation in Collaborative Robot Applications”, *International Collaborative Robots Workshop*, 3 May 2016 (Boston, Massachusetts)

“Advancing Technology Through Flexibility and Collaboration”, *RoboBusiness*, 16 October 2014 (Boston, Massachusetts)

“Modeling Robot Assembly Tasks in Manufacturing Using SysML”, *45th International Symposium on Robotics*, 3 June 2014 (Munich, Germany)

“Planning with a Task Modeling Framework in Manufacturing Robotics”, *IEEE/RSJ International Conference on Intelligent Robots and Systems*, 6 November 2013 (Tokyo, Japan)

“A Taxonomic Framework for Task Modeling and Knowledge Transfer in Manufacturing Robotics”, *8th International Conference on Cognitive Robotics*, 23 July 2012 (Toronto, Canada)

“Dealing with the Third Enemy: Scandinavian Immigrants and Related Language Issues in Pioneer Utah.” *Scandinavian Heritage Conference*, May 26, 2005 (Ephraim, Utah) (with Lynn Henrichsen and George Bailey).

“Dealing with the Third Enemy: Scandinavian Immigrants and Related Language Issues in Pioneer Utah.” *95th Annual Meeting of the Society for the Advancement of Scandinavian Study*, May 6, 2005 (Portland, Oregon) (with Lynn Henrichsen and George Bailey).

“Dealing with the Third Enemy: Utah’s Scandinavian Pioneers’ Struggles with the English Language.” *Deseret Language and Linguistics Society Symposium*, March 18, 2005 (Provo, Utah) (with Lynn Henrichsen and George Bailey).

## Professional Activities

**US National Delegation Member**, ISO TC299 WG3 - Industrial Robot Safety (2014 - )

**Committee Member**, RIA R15.06 - Industrial Robot Safety (2014 - )

**President and Founder**, Georgia Tech Robotics Graduate Student Organization (2010-2012)

IEEE Member (2007 - ), Robotics and Automation Society, Computational Intelligence Society, Computer Society

AAAI Student Member (2010 - 2014 )

## Other Activities

**Troop Committee Member**, Boy Scouts of America Troop 44 (2008-2013)

**Volunteer Representative**, various regions in Denmark (2001-2003)

## Honors, Awards, & Fellowships

Emmy Award for Best Television Commercial Produced in the Southeast, 2010

National Consortium for MASINT Research Scholar, 2006 & 2007

## Programming Skills

C, C++, Python, MATLAB, LabVIEW

ROS, PCL, OpenCV, Gazebo

Linux, Windows, RTAI

## Languages

English, Danish

## Citizenship

USA

March 29, 2021