Vivian Chu

vchu05@gmail.com
http://www.vivianchu.org

Education

2018 Ph.D. in Robotics
Georgia Institute of Technology
Advisors: Andrea L. Thomaz and Sonia Chernova
Committee: Henrik I. Christensen, Charles C. Kemp, Siddhartha Srinivasa

2013 M.S. in Robotics
University of Pennsylvania
Advisor: Katherine J. Kuchenbecker

2009 B.S. in Electrical and Computer Engineering (EECS)
University of California, Berkeley

Awards

Rising Star in EECS, Stanford 2017
60 out of 323 PhD students and PostDocs
Highly selective workshop for future faculty in EECS

Nominated Best Technical Advance in HRI Paper, HRI 2016
At the International Conference on Human-Robot Interaction
"*Learning Object Affordances by Leverage the Combination of Human-Guidance and Self-Exploration*"

Human-Robot Interaction Pioneer 2016
Highly selective workshop that identifies future researchers in HRI

AAAI-15 Robotics Fellowship 2015
10 of 72 students awarded grant to travel and present their research at AAAI-15

Google Anita Borg Scholar 2014
One of 25 students in the U.S. selected for highly competitive scholarship for CS women

Best Cognitive Robotics Paper, ICRA 2013
At the International Conference on Robotics and Automation
"*Using Robotic Exploratory Procedures to Learn the Meaning of Haptic Adjectives*"

Honorable Mention: NSF Graduate Research Fellowship 2013
Top 32% of applicants are awarded honorable mentions

Research Experience

Socially Intelligent Machines Lab, IRIM, Georgia Tech 2013-2017
Graduate Research Assistant with Dr. Andrea L. Thomaz

Robot Autonomy and Interactive Learning Lab, IRIM, Georgia Tech 2015-2017
Graduate Research Assistant with Dr. Sonia Chernova

- Helped write NSF 4-year grant on affordance research that was successfully funded
- Developed system to learn and predict affordances in objects using primitive action manipulation and multisensory (haptic + vision) data
- Developed real-time multimodal (vision + audio) system to detect robot engagement

- Integrated ROS with multiple robots (MEKA, Stanley Innovation) in simulation and on the real system

Haptics Lab, GRASP Lab, University of Pennsylvania January 2012 - May 2013
Research Assistant with Dr. Katherine J. Kuchenbecker
- Co-led team for DARPA-funded BOLT-E robotic language grounding program
- Collaborated in integrating Syntouch BioTacs, a new touch sensor, onto Willow Garage's PR2
- Wrote real-time controller for PR2 in ROS to perform exploratory procedures on objects
- Published award-winning paper at ICRA 2013 based on the DARPA-funded research with UC Berkeley

Professor Dennis K. Lieu, UC Berkeley August 2008 - May 2009
Undergraduate Research Assistant with Dr. Dennis K. Lieu
- Led undergrad research team working on the integration of flywheels for a triple hybrid drive train
- Calculated efficiency of drive train integrated with different designs of flywheels and battery types

Industry Experience

Diligent Robotics, Austin, TX July 2015 - Present
CTO
- Developed novel system, which resulted in a provisional patent, and piloted in two hospitals
- Interviewed nurses and hospital management to helped write SBIR grant for future funding

Google[x], Mountain View, CA May 2015 - August 2015
Research Intern
- Conducted user studies for Project Wing (UAV delivery project), which resulted in new design specifications for the package delivery system.
- Prototyped delivery mechanisms and collected and analyze data for package delivery specifications

Honda Research Institute, Mountain View, CA June 2013 - August 2013
Research Intern
- Developed human-car interfaces for eyes-free search queries and conducted user studies on system safety

International Business Machine (IBM), San Jose, CA August 2009 - August 2011
Software Engineer
- Published paper in CIKM 2011 on refined pattern discovery tool for SystemT
- Integrated pattern discovery standalone tool for unstructured text into IBM's Infosphere BigInsights
- Published paper in PVLDB 2010 on provenance research
- Developed queries for information integration on large (TB) datasets; redesigned SystemT UI and backend

Residential Computing, UC Berkeley, Berkeley, CA August 2008 - June 2009
Lead Desktop Administrator
- Managed four-member Desktop Administration team with sole discretion over hiring and annual evaluations
- Managed six residential computing centers serving 6,000 residents that offer 150 computers with Mac and Windows run off Ethernet-base network hosted by UNIX-based server

Publications

Peer-Reviewed Journal Articles

J1 **V. Chu**, A. L. Thomaz, "Analyzing Differences between Teachers when Learning Object Affordances via Guided-Exploration". International Journal of Robotics Research (IJRR), 2017

J2 **V. Chu**, I. McMahon, L. Riano, C. G. McDonald, Q. He, J. M. Perez-Tejada, M. Arrigo, T. Darrell, K. J. Kuchenbecker, "Robotic Learning of Haptic Adjectives Through Physical Interaction". Robotics and Autonomous Systems (RAS), 2015

Peer-Reviewed Conference Papers

C3 **V. Chu**, B. Akgun, A.L. Thomaz, "Learning Haptic Affordances from Demonstration and Human-Guided Exploration". HAPTICS, 2016

C4 **V. Chu**, T. Fitzgerald, A.L. Thomaz, "Learning Object Affordances by Leverage the Combination of Human-Guidance and Self-Exploration". HRI, 2016 **(Nominated for Best Technical Advance in HRI Award)**

C5 **V. Chu**, K. Bullard, A.L. Thomaz, "Multimodal Real-Time Contingency Detection for HRI". IROS, 2014

C6 **V. Chu**, I. McMahon, L. Riano, C. G. McDonald, Q. He, J. M. Perez-Tejada, M. Arrigo, N. Fitter, J. C. Nappo, T. Darrell, K. J. Kuchenbecker. "Using Robotic Exploratory Procedures to Learn the Meaning of Haptic Adjectives". ICRA, 2013 **(Best Cognitive Robotics Paper Award)**

C7 Y. Li, **V. Chu**, S. Blohm, H. Zhu, H. Ho. "Facilitating Pattern Discovery for Relation Extraction with Semantic-Signature-Based Clustering". CIKM, 2011: 1415-1424.

C8 B. Liu, L. Chiticariu, **V. Chu**, H. V. Jagadish, and F. R. Reiss. "Automatic Rule Refinement for Information Extraction". PVLDB (Research Track), Singapore, 2010

C9 B. Liu, L. Chiticariu, **V. Chu**, H. V. Jagadish, and F. R. Reiss. "Refining Information Extraction Rules Using Data Provenance". IEEE Data Engineering Bulletin, 2010.

Peer-Reviewed Workshop, Symposium, Demonstration Papers

S10 **V. Chu**, A.L. Thomaz, "Exploring Affordances Using Human-Guidance and Self-Exploration", AI for HRI at AAAI Fall Symposium, 2015

S11 B. Akgun, K. Bullard, **V. Chu**, A. L. Thomaz, "An HRI Approach to Learning from Demonstration". AI for HRI at AAAI Fall Symposium, 2014

W12 **V. Chu**, A.L. Thomaz, "Understanding the Role of Haptics in Affordances". RSS Workshop on Affordances in Vision for Cognitive Robotics, 2014

W13 I. McMahon, **V. Chu**, L. Riano, C. G. McDonald, Q. He, J. M. Perez-Tejada, M. Arrigo, N. Fitter, J. C. Nappo, T. Darrell, K. J. Kuchenbecker. "Robotic Learning of Haptic Adjectives Through Physical Interaction". IROS Workshop on Advances in Tactile Sensing and Touch-based Human-Robot Interaction, 2012

D14 L. Chiticariu, **V. Chu**, S. Dasgupta, T. W. Goetz, H. Ho, R. Krishnamurthy, A.Lang, Y. Li, B. Liu, S.Raghavan, F. R. Reiss, S. Vaithyanathan, and H. Zhu."The SystemT IDE: An Integrated Development Environment for Information Extraction Rules". SIGMOD Conference 2011: 1291-1294 (Demonstration)

D15 S. Balakrishnan, **V. Chu**, M. A. Hernández, H. Ho, R. Krishnamurthy, S. Liu, J. Pieper, J. S. Pierce, L. Popa, C. Robson, L. Shi, I. R. Stanoi, E. L. Ting, S. Vaithyanathan, H. Yang, "Midas: Integrating Public Financial Data". SIGMOD Conference 2010: 1187-1190 (Demonstration)

Patents

P16 **V. Chu**, A.L. Thomaz, "Method and System for Robotic Execution of a Perceptually Constrained Manipulation Skill Learned via Human Demonstration". U.S. Provisional Patent, Filed March 14, 2017.

P17 S. J. Blohm, **V. Chu**, C.T. Ho, Y. Li, H.Zhu. 2014. "Systems and Methods for Information Extraction Using Contextual Pattern Discovery". U.S. Patent 8,630,989, filed May 27, 2011, and issued January 14, 2014. Source: USPTO database.

Teaching

Introduction to Robotics and Perception, Georgia Institute of Technology
Lead Teaching Assistant - Spring 2017, Teaching Assistant - Spring 2016

- Undergraduate course that covers fundamental problems and leading solutions for computer and robot perception and action from the point of view of autonomous robot navigation.
- Led in class lab sessions when instructor is away, hold weekly office hours, helped design and construct labs, grade quizzes and exams

Grants

Leveraging Human Interaction to Efficiently Learn and Use Multimodal Object Affordances
Contributed to grant development and writing
National Science Foundation (NSF) Cyber-Human Systems (CHS) Medium, 2016-2020
PIs: Andrea L. Thomaz and Sonia Chernova

Travel Grants
HRI Pioneers, 2016
CRA-W Grad Cohort, 2012 and 2016
AAAI Robotics Fellow Travel Grant, 2015
Google Anita Borg - Grace Hopper Conference, 2015
Student Travel Grant at IROS, 2014
Student Travel Grant at ICRA, 2013

Leadership and Academic Service

Organizing Committee

AAAI Spring Symposium Series (SSS) 2017
Symposium on Interactive Multi-sensory Object Perception for Embodied Agents
Co-organizer

International Conference on Human-Robot Interaction (HRI) 2017
HRI Pioneers Workshop
Publicity/Web Chair

International Conference on Intelligent Robots and Systems (IROS) 2017
Workshop on Synergies Between Learning and Interaction
Co-organizer

Program Committee

Revisiting Contact - Turning a problem into a solution at RSS 2017

Socially and Physically Assistive Robotics at RSS 2016

Refereeing: Conference and Journals

IEEE International Conference on Robotics and Automation (ICRA) 2018

ACM/IEEE International Conference on Human Robot Interaction (HRI) 2018

Conference on Robot Learning (CoRL) 2018

IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2016-2017

IEEE World Haptics Conference (WHC) 2017

ACM Conference on Human Factors in Computing System (CHI)
Excellent Reviewer Recognition 2017

IEEE Transactions on Automation Science and Engineering 2016-2017

IEEE Transactions on Haptics 2016

AAAI Fall Symposium - AI for HRI 2016

IEEE/RAS International Conference on Humanoid Robots (Humanoids) 2015

Other Service

Georgia Tech Graduate Women @ College of Computing 2015 - 2017
Board Member
Help organize bi-weekly coffee breaks, outreach events, and faculty luncheons for the graduate women community in computing at Georgia Tech.

RoboGrads 2014 - 2016
VP of Academics (2014-2015), VP of Robotics PhD (2015-2016)
Student-run graduate group that supports all graduate students who do robotics research (200 students) at Georgia Tech. As VP of Academics, I organized student seminars, faculty mentoring events, as well as general board responsibilities. As VP of Robotics PhD, I helped support the 60 PhD Robotics students for qualifier preparation, representing RoboGrad at the robotics faculty meetings, as well as playing a key role in shaping and adapting the qualifiers.

Society of Women Engineers (SWE) 2012 - 2016
Participated in SWE for many years across my graduate studies to help support graduate women in STEM on the university, local, and nationally levels.

- ***Georgia Tech*** - *Academic Chair (2014-2015), Vice-President of Graduate Student Section (2015-2016).* Worked closely with the founder of the Georgia Tech Graduate SWE section to grow membership and coordinate social and academic events. Started the now annual event "The Value of a Graduate Degree", aimed at encouraging undergraduate women to pursue graduate school.
- ***Region D*** - *Co-Graduate Liaison (2014-2016).* Helped coordinate the graduate content at the annual Region D conference. Started a newsletter for graduates in the southwest region to connect SWE members in the region.
- ***National Graduate Section*** - *Webinar Coordinator (2013-2014).* Organized six webinars for the graduate SWE community throughout the year that cover topics like "Networking: Building Your Research Village" and "Writing for Publication".
- ***University of Pennsylvania*** - *Vice-President (2011-2012), President (2012-2013).* Co-founded the graduate SWE section at Penn where we grew to 50 members within the first semester. Hosted workshops on resumes and fellowship writing. Started a mentor program that paired 30 graduate women with mentors. Traveled to the National SWE conference to host a workshop for other universities to start graduate sections.

Selected Outreach

National Robotics Week, April 2012-2017
Every year during National Robotics Weeks, I demonstrate robots to hundreds of visitors. I have done this every year starting from my time at Penn to my time at Georgia Tech.

SWE Outreach Events, 2012-2016
I have attended several day-long outreach events where girls of various ages participate in hands-on STEM

workshops. As a graduate student, I typically lead the activities (e.g. how to make rockets, build circuits, etc.) and guide the undergraduate volunteers.

Upward Bound Math and Science, 2012
Upward Bound Math and Science is a program that helps low-income first-generation-to-college high school students develop their potential in STEM. For two weekends, my NASA RASCAL team worked with students to build an underwater robot. The students learned how to water-proof motors, solder a controller, and design the frame of the whole robot.

Selected Media Coverage

Investors Back Robotics for Health, Companionship, WSJ Pro Venture Capital 2018

Social Smarts for Robots, True Ventures 2018

25 women in robotics you need to know about - 2016, Robohub 2016

Finally: Robots Learn What 'Squishy' Really Means, IEEE Spectrum 2013

Skills

Software: ROS, Eclipse, Hadoop, ProE, SolidWorks
Programming: Scheme, Java, C/C++, MIPS, Matlab, Python, Batch, AutoIt, LabView, JAQL, SQL
Language: English (native), Mandarin (proficient), Japanese (basic)
Citizenship: USA