MEIYING QIN
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meiying.qin@yale.edu

Education

- 2016.9 – present, Ph.D student, Social Robotics Lab, Computer Science Department, Yale University
  Supervisor: Professor Brian Scassellati
- 2010 – 2016, Honours Bachelor of Science with High Distinction, University of Toronto
  Major in Computer Science and Psychology, Minor in Mathematics
- 2006 – 2010, Honours Bachelor of Science, Peking University
  Major in Life Science (Biology)

Research Interest

Robot Tool Use, Robot Inverse Kinematics and Dynamics, Reasoning, Human-Robot Collaboration, Human-Robot Interaction, Animal-Robot Interaction, Artificial Intelligence, Machine Learning

Publication

M. Qin, Y. Huang*, E. Stumph*, E., L. Santos, B. Scassellati. (2020). Dog Sit! Domestic Dogs (*Canis familiaris*) Follow a Robot's Sit Commands. In Companion of the 2020 ACM/IEEE International Conference on Human-Robot Interaction (HRI '20 Companion), March 23-26, 2020, Cambridge, United Kingdom. ACM, New York, NY, USA, 9 pages. https://doi.org/10.1145/3371382.3380734 (*: These authors contributed equally to this work.)

Scassellati, B., Boccanfuso L.*, Huang, C.-M.*, Mademtzi, M.*, **Qin, M.*,** Salomons, N.*, Ventola, P., Shic, F. (2018). Improving Social Skills in Children with ASD Using a Long-term, In-home Social Robot. *Science Robotics*, Vol 3 (21). DOI: 10.1126/scirobotics.aat7544 (*: These authors contributed equally to this work.)

Qin, M., Wong, A., Seguin, D., Gerlai, R. (2014). Induction of Social Behavior in Zebrafish: Live Versus Computer Animated Fish as Stimuli. *Zebrafish*, 185-197. DOI: 10.1089/zeb.2013.0969

Research in PhD Studies

- 2019.8 – present, Tool Use Learning in Robots
  - Problem Statement: To enable robots to learn to use tools with minimal training samples.
  - Background: The ability for a robot to rapidly learn tool use skills would enable it to quickly complete a wide range of tasks, without having to wait for a long period of time for training. Current algorithms either tailored the robot to use a limited set of tools, or

trained with massive amount of training samples to use a wide range of tools.
    - Our Approach: I developed a framework that extended the inverse kinematics and utilized the change of reference frames (EIKCORF) to enable a robot to learn to use diverse tools with minimal training.
    - Results: Experiments showed that EIKCORF is able to (1) move a tool in the end-effector to the desired pose in the inertial space, (2) learn the tool usages (e.g., the relation between the tool and the target object), and (3) learn the tool affordances (e.g., the effect of the tool on the target object).
- 2018.8 – 2019.4, Robot Reasoning Study on Tool Use
    - Problem Statement: The computational approach of integrating logical reasoning and statistical learning to reason about tool usages.
    - Background: Statistical learning such as machine learning always result in a 'black box'. System could hardly reason about what it learned.
    - Our Approach: I integrated the statistical learning as the lower level framework which focus on perception, and the logical reasoning as the higher-level framework which focus on cognition.
    - Results: The robot learned to choose the appropriate tools to complete a pushing task.
- 2018.9 – 2019.12, Canine-Robot Interaction Study 2
    - Problem Statement: Whether dogs would interact with a social robot at all.
    - Background: Same as the Canine-Robot Interaction Study
    - Our Approach: I tested whether dogs would respond to robot calling their names after a short interaction and whether dogs would follow a robot's 'Sit' commands after a long interaction.
    - Results: Dogs responded when robot called their names and followed the 'Sit' commands.
- 2017.9 – 2018.9, Canine-Robot Interaction Study
    - Problem Statement: Whether dogs would interact with a social robot.
    - Background: As personal social robots become more prevalent, the need for the designs of these systems to explicitly consider pets become more apparent. However, it is not known whether dogs would interact with a social robot.
    - Our Approach: We tested whether dogs follow a Nao robot's pointing gestures.
    - Results: Dogs did not follow the robot's pointing gestures.
- 2017.1 – 2018.8, Responsibility Study
    - Problem Statement: The ethical question on who should take the responsible when robot's behaviors resulted in undesirable consequences.

    - Background: Personal robots are more prevalent, and chances of the robots misbehaved while interacting with people increases with the exposure. Little was known on how people would attribute responsibilities to the different roles related to the robots.
    - Our Approach: I compared how participants attributed responsibilities among different roles when a robot misbehaved: the owner, the developer/tele-operator, the manufacturer, the participants and the robot.
    - Results: Participants mainly attributed the responsibility to the developer/tele-operator.
- 2016.9 – 2018.4, Social Assistive Robot Project
    - Problem Statement: The robot's long-term effects of the social behaviors of children with autism spectrum disorder (ASD).
    - Background: Social robots can offer tremendous possibilities for ASD interventions. Most studies with this population have used short, isolated encounters in controlled laboratory settings, while the effect of a long-term home-based interactions is not known.
    - Our Approach: We developed a system that was deployed in the home of children with ASD.
    - Results: The system maintained engagement over the 1-month deployment, and children showed improvement on joint attention skills with adults when not in the presence of the robot.
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Teaching Experiences

- 2019.1 – 2019.5, Teaching Assistant, CPSC470/570 – Artificial Intelligence, Yale University
- 2018.1 – 2018.5, Teaching Assistant, CPSC277/577 – Natural Language Processing, Yale University
- 2017.9 – 2017.12, Teaching Assistant, CPSC470/570 – Artificial Intelligence, Yale University
- 2016.5 – 2016.8, Teaching Assistant, MAT134 – Calculus for Life Sciences, University of Toronto
- 2016.1 – 2016.4, Teaching Assistant
    - MAT223 – Linear Algebra 1, University of Toronto
    - PHL245 – Modern Symbolic Logic, University of Toronto
- 2015.9 – 2015.12 Teaching Assistant
    - CSC207 – Software Tools and System Programming, University of Toronto
    - CSC108 – Introduction to Computer Programming, University of Toronto
    - MAT102 – Introduction to Mathematical Proofs, University of Toronto
- 2014.1 – 2014.4 Teaching Assistant
    - PHL245 – Modern Symbolic Logic, University of Toronto
- 2013.9 – 2013.12 Teaching Assistant

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- 2013.1 – 2013.4 Teaching Assistant
    - PHL245 – Modern Symbolic Logic, University of Toronto

Industry Experiences

2014.9 – 2015.8, Application Software Developer - Student, BlackBerry, Full-time Internship

- Project 1: 2014.9 – 2015.4, Bug fixing for three core apps and service (Smarttags, Smarttriggers and TargetSelect). Main language: c++. Platform: BB10
- Project 2: 2015.1 – 2015.4, Bug fixing and design for screen reader for accessibility. Main language: python. Platform: BB10
- Project 3: 2015.5 – 2015.8, Designed and implemented new feature to set and launch app when user plug in headset or HDMI cable on a per user basis. Main language: java. Platform: Android

Volunteer Experiences

- 2014.2 – 2015.8, Volunteer, ErinoakKids (An organization helping children with disabilities)
- 2013.9 – 2014.4, Note-taker Volunteer, AccessAbility Resource Centre, University of Toronto
- 2011.5 – 2011.7, Support Assistance Volunteer, AccessAbility Resource Centre, University of Toronto
- 2011.2 – 2012.1, Volunteer Caregiver to Cats, Abandoned Cats Rescue

Skills

- Language: Native reader, writer, and speaker of Mandarin; c/c++; python; matlab; java; R; SQL; javascript; html; VB
- Interests: Appreciate food, Gardening, Formula One, Go kart, Piano