

# Jimmy Li

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## Education

- Ph.D. in Computer Science (Robotics), supervised by Gregory Dudek and David Meger, McGill University, 2013 – 2021
- Mini-MBA Executive Development Certificate, McGill University, 2016
- B.A.Sc. Computer Science and Economics, Dean's Honour List, McGill University, 2012

## Journals

- T. Manderson, **Jimmy Li**, N. Dudek, D. Meger, and G. Dudek (2017), Robotic Coral Reef Health Assessment Using Automated Image Analysis. *Journal of Field Robotics*, 34: 170–187. doi:10.1002/rob.21698

## Refereed Conference Papers

- **Jimmy Li**, Karim Koreitem, David Meger, and Gregory Dudek. View-Invariant Loop Closure with Oriented Semantic Landmarks. In *Proceedings of the International Conference on Robotics and Automation (ICRA)*. Paris, France. May 2020.
- **Jimmy Li**, David Meger, and Gregory Dudek. Semantic Mapping for View-Invariant Relocalization. In *Proceedings of the International Conference on Robotics and Automation (ICRA)*. Montreal, Canada. May 2019.
- Karim Koreitem, **Jimmy Li**, Ian Karp, Travis Manderson, and Gregory Dudek. Underwater Communication Using Full-Body Gestures and Optimal Variable-Length Prefix Codes. In *Proceedings of the International Conference on Robotics and Automation (ICRA)*. Montreal, Canada. May 2019.
- Karim Koreitem, **Jimmy Li**, Ian Karp, Travis Manderson, Florian Shkurti, and Gregory Dudek. Synthetically Trained 3D Visual Tracker of Underwater Vehicles. *MTS/IEEE OCEANS*. Charleston, SC, USA. October 2018.
- **Jimmy Li**, Zhaoqi Xu, David Meger, and Gregory Dudek. Semantic scene models for visual localization under large viewpoint changes. *Conference on Computer and Robot Vision (CRV)*. Toronto, Canada. May 2018.
- **Jimmy Li** and David Meger and Gregory Dudek. Context-coherent scenes of objects for camera pose estimation. In *Proceedings of the International Conference on Intelligent Robots and Systems (IROS)*. Vancouver, Canada. September 2017.
- F. Shkurti, W. Chang, P. Henderson, M. Islam, J. Higuera, **Jimmy Li**, T. Manderson, A. Xu, G. Dudek, and J. Sattar. Underwater Multi-Robot Convoying using Visual Tracking by Detection. In *Proceedings of the International Conference on Intelligent Robots and Systems (IROS)*. Vancouver, Canada. September 2017.
- **Jimmy Li** and David Meger and Gregory Dudek. Learning to Generalize 3D Spatial Relationships. In *Proceedings of the International Conference on Robotics and Automation (ICRA)*. Stockholm, Sweden. May 2016.

- T. Manderson, D. Meger, **Jimmy Li**, D. Cortés Poza, N. Dudek, and G. Dudek. Towards Autonomous Robotic Coral Reef Health Assessment. Proceedings of Field and Service Robotics (**FSR**). Toronto, Canada. June 2015.
- F. Shkurti, A. Xu, M. Meghjani, J. Higuera, Y. Girdhar, P. Giguere, B. Dey, **Jimmy Li**, A. Kalmbach, C. Prahacs, K. Turgeon, I. Rekleitis, and G. Dudek. Multi-Domain Monitoring of Marine Environments Using a Heterogeneous Robot Team. In Proceedings of the International Conference on Intelligent Robots and Systems (**IROS**), Algarve, Portugal. October 2012.
- **Jimmy Li** and Anqi Xu and Gregory Dudek. Graphical State Space Programming: A Visual Programming Paradigm for Robot Task Specification. In Proceedings of the International Conference on Robotics and Automation (**ICRA**), pp. 4846--4853. Shanghai, China. May 2011. Source code and tutorials at <http://www.cim.mcgill.ca/gssp/>

## Awards

- NSERC Graduate Scholarship PGS D, 2014 – 2017
- Pierre Arbour Doctoral Scholarship, 2013 – 2015
- FQRNT Graduate Research Scholarship B2 (Declined, conflicted with NSERC PGS D)
- FQRNT Graduate Research Scholarship B1, 2013 – 2014
- NSERC Canada Graduate Scholarship CGS M, 2012 – 2013
- CRA Outstanding Undergraduate Researcher Awards Honorable Mention, 2012
- NSERC Undergraduate Student Research Award (USRA), 2010 and 2011
- Sigma Xi Excellence in Undergraduate Research Award, 2011
- Dean's Honour List, McGill University, 2009 and 2012

## Work Experience

### Research Scientist, Samsung AI Center Montreal, Feb 2021–Present

- Research in machine learning with a focus on cellular network optimization

### Research Intern, Samsung AI Center Montreal, April–Dec 2020

- Cellular network load-balancing using reinforcement learning
- Development of machine learning experimental framework with support for distributed computing

### Co-founder, Scaffold AI, 2019–Present

- Apply computer vision and robotics to forestry automation
- Enterprise sales

### Co-founder & CTO, Zazz Mobility, 2015–2017

- Led a team of 2 engineers to develop a mobile application for organizing carpools for daily commute
- Won \$16,000 in seed funding for my team in startup competitions

### System Staff, School of Computer Science, McGill University, 2011–2014

- Managed Linux servers, websites and lab machines (LDAP, Apache, Bash, Python)

### Internship, Morgan Stanley, 2012

- Integrated several existing source code management tools into a single graphical user interface (Git, Jenkins, Gerrit, Scala, Spring Framework)

## Teaching and Advising Experience

**Instructor for Data Structures and Algorithms (CCCS 315), School of Continuing Studies, McGill University, Winter 2020 (Ongoing)**

- Object-oriented concepts (inheritance, polymorphism, generics etc.), complexity theory, linear data structures, trees, graphs, sorting algorithms, recursion, induction proofs
- Enrolment: 40

**Instructor for Principles of Web Development (COMP 307), School of Computer Science, McGill University, Winter 2020 (Ongoing)**

- HTTP, HTTPS, WebSocket, CGI, HTML, JavaScript, CSS, PHP, Django, common security vulnerabilities in web applications
- Enrolment: 125

**Instructor for Programming Techniques 1 (CCCS 300), School of Continuing Studies, McGill University, 2018-2019**

- Introduction to Java programming: conditionals, control flow, object-oriented programming, arrays, loops, recursion, file operations, exceptions, graphical user interface
- Enrolment: 77 (Fall 2018), 34 (Winter 2019), 47 (Fall 2019)

**Advisor for Undergraduate Research Project (COMP 396), McGill University, Winter 2019 and Winter 2020**

- Supervised undergraduate students who conducted research in computer vision (city skyline extraction, semantic keypoint detection)

**Advisor for Undergraduate Summer Research, McGill University, 2016**

- Supervised an undergraduate student who used web technologies to design a graphical user interface for specifying robot trajectories and tasks for outdoor deployments

## **Research Projects**

**View-invariant camera localization, Ph.D. dissertation, McGill University, 2013 – 2021**

- Used objects detected in images to robustly infer camera pose regardless of viewing direction
- Designed semantic simultaneous localization and mapping system that uses objects for view-invariant relocalization and loop closure
- Used inter-object context to regularize scene geometry and improve camera localization

**Aqua project, McGill University, 2011 – 2019**

- Contributed to a variety of research projects that involve the amphibious Aqua robot
  - Vision-based coral reef health assessment
  - Vision-based multi-robot convoying
  - Multi-robot systems involving aerial and marine robots
  - Multi-robot visual communication via full-body gesturing
- Participated in annual field trials in Barbados where the Aqua robot is deployed in the ocean

**Robot task specification, McGill University, 2010 – 2012**

- Designed the Graphical State Space Programming framework for robot task specification: allows human operator to attach reactive behaviors that trigger when state space constraints are satisfied
- Source code and tutorials at <http://www.cim.mcgill.ca/gssp/>

## **Publication Reviewing**

**International Conference on Robotics and Automation (ICRA)**

- Reviewed a total of 3 conference contributions in 2013, 2018, and 2019

#### **International Conference on Intelligent Robots and Systems (IROS)**

- Reviewed a total of 9 conference contributions in 2017, 2018, 2019, and 2020

#### **Conference on Computer and Robot Vision (CRV)**

- Reviewed a total of 2 conference contributions in 2020

### **Service to the Research Community**

#### **Manager of Robot Field Trials and Research Workshop in Barbados, 2016**

- Managed travel and equipment transportation from Montreal to Barbados
- Coordinated field experiments, scheduling, and resource allocation

### **Invited Talks**

#### **Entrepreneurship Workshop, NSERC Canadian Robotics Network Annual General Meeting. Kingston, Ontario. 2019**

- Gave presentation on strategies for startups and commercialization to 50 graduate students, university faculty members, and industrial partners

#### **Robotics Summer Camp, School of Computer Science, McGill University. Montreal, Quebec. 2010**

- Presented my research on robot task specification to 40 high school students participating in the summer camp

### **Languages**

- English
- Mandarin Chinese

### **Citizenship**

- Canadian

### **References**

- **Gregory Dudek**  
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- **David Meger**  
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