

# KEVIN KAR WAI LAI

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## AREAS OF EXPERTISE

- Computer Vision, Machine Learning, and Robotics.

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## EDUCATION

Ph.D. in Computer Science	<b>University of Washington</b> , Seattle, WA	12/2013
Thesis: Object Recognition and Semantic Scene Labeling for RGB-D Data		
Advisor: Dieter Fox		
M.S. in Computer Science	<b>University of Washington</b> , Seattle, WA	06/2010
Advisor: Dieter Fox		
B.S. in Computer Science	<b>University of British Columbia</b> , Vancouver, BC	05/2008
GPA: 92.3%		

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## WORK EXPERIENCE

- 03/2014 – Present      **Research Scientist, Amazon Corporate LLC**      **Seattle, WA**
- Working on computer vision and machine learning projects.
- 06/2012 – 09/2012      **Research Intern, NEC Laboratories America**      **Cupertino, CA**
- Internship with the Media Analytics group. Developed an efficient, feed-forward, supervised learning technique for image scene labeling, reducing error rate by 25% over an existing Markov Random Field (MRF) based method on semantic segmentation and image denoising tasks.
- 09/2008 – 12/2013      **Research Assistant, UW**      **Seattle, WA**
- Advised by Professor Dieter Fox. Developed a robust and fast (< 1 second) object recognition system that uses RGB-D (Kinect-like) cameras. The system obtains 90% accuracy on the RGB-D Object Dataset consisting of 300 objects and 22 indoor video sequences. Now one of the most widely used benchmarks for RGB-D recognition (600 citations according to Google Scholar).
- 05/2007 – 08/2007      **Undergraduate Research Student, UBC**      **Vancouver, BC**
- Joined the group supervised by Professors David Lowe and Jim Little. Developed mapping and planning algorithms for a robot that autonomously searches an environment for objects. The system, developed using a combination of MATLAB and the Player/Stage framework (C++), is the winner of the Semantic Robot Vision Challenge in 2007 and 2008.
- 09/2006 – 12/2006      **Game AI Programmer (Intern), Threewave Software**      **Vancouver, BC**
- Designed and developed behaviour and control logic for an enemy AI in a first-person shooter game. Collaborated with designers and artists to create an engaging gaming experience. The game was built on top of Valve's Source game engine and written in Visual C++.
- 05/2006 – 08/2006      **Software Developer (Intern), Business Objects**      **Vancouver, BC**
- Internship with the Enterprise Reporting Designer team. Developed GUI features including the *Formula Expert* for Crystal Reports (Java), a business report generation and viewing tool.

01/2005 – 08/2005      **Software Developer (Intern), IBM Canada**      **Markham, ON**

- Internship with the IBM Debug team. Developed a memory visualization tool within the Eclipse plug-in framework for a compiled-language (C/C++, Fortran) debugger that displays memory formatted according to XML files.

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## AWARDS AND HONORS

- Finalist for Best Vision Paper Award at the IEEE International Conference on Robotics & Automation (ICRA), 2014.
- Best Vision Paper Award at the IEEE International Conference on Robotics & Automation (ICRA), 2011.
- Intel Science and Technology (ISTC) Graduate Fellowship, 2011.
- NSERC Postgraduate Scholarship, 2008-2011.
- CSE First-Year Fellowship, 2008.
- Clairmont L. Egtvedt Endowed Engineering Fellowship, 2008.
- CRA Outstanding Undergraduate Award - Honorable Mention, 2008.
- NSERC Undergraduate Student Research Award, 2007.

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## PUBLICATIONS

### **Unsupervised Feature Learning for 3D Scene Labeling**

Kevin Lai, Liefeng Bo, and Dieter Fox

IEEE International Conference on Robotics and Automation (ICRA), May 2014.

*Finalist for Best Vision Paper Award*

### **RGB-D Object Recognition: Features, Algorithms, and a Large Scale Benchmark.**

Kevin Lai, Liefeng Bo, Xiaofeng Ren, and Dieter Fox

Consumer Depth Cameras for Computer Vision: Research Topics and Applications, 2013.

### **Detection-based Object Labeling in 3D Scenes**

Kevin Lai, Liefeng Bo, Xiaofeng Ren, and Dieter Fox

IEEE International Conference on Robotics and Automation (ICRA), May 2012.

### **A Scalable Tree-based Approach for Joint Object and Pose Recognition**

Kevin Lai, Liefeng Bo, Xiaofeng Ren, and Dieter Fox

Twenty-Fifth Conference on Artificial Intelligence (AAAI), August 2011.

### **Object Recognition with Hierarchical Kernel Descriptors**

Liefeng Bo, Kevin Lai, Xiaofeng Ren, and Dieter Fox

IEEE International Conference on Computer Vision and Pattern Recognition (CVPR), June 2011.

### **Sparse Distance Learning for Object Recognition Combining RGB and Depth Information**

Kevin Lai, Liefeng Bo, Xiaofeng Ren, and Dieter Fox

IEEE International Conference on Robotics and Automation (ICRA), May 2011.

*Best Vision Paper Award*

### **A Large-Scale Hierarchical Multi-View RGB-D Object Dataset**

Kevin Lai, Liefeng Bo, Xiaofeng Ren, and Dieter Fox

IEEE International Conference on Robotics and Automation (ICRA), May 2011.

### **Object Recognition in 3D Point Clouds Using Web Data and Domain Adaptation**

Kevin Lai and Dieter Fox

International Journal of Robotics Research 29(8), Jul 2010.

### **3D Laser Scan Classification Using Web Data and Domain Adaptation**

Kevin Lai and Dieter Fox

Robotics: Science and Systems (RSS), Jul 2009.

### **Curious George: An Attentive Semantic Robot**

David Meger, Per-Erik Forssén, Kevin Lai, Scott Helmer, Sancho McCann, Tristram Southey, Matthew Baumann, James J. Little, and David G. Lowe

Robotics and Autonomous Systems Journal 56(6), Jun 2008.

### **Informed Visual Search: Combining Attention and Object Recognition**

Per-Erik Forssén, David Meger, Kevin Lai, Scott Helmer, James J. Little, and David G. Lowe

IEEE International Conference on Robotics and Automation (ICRA) 2008, May 2008.

### **Curious George: An Attentive Semantic Robot**

David Meger, Per-Erik Forssén, Kevin Lai, Scott Helmer, Sancho McCann, Tristram Southey, Matthew Baumann, James J. Little, David G. Lowe, and Bruce Dow

IROS 2007 Workshop: From Sensors to Human Spatial Concepts, Nov 2007.

### **Curious George: The UBC Semantic Robot Vision System**

Scott Helmer, David Meger, Per-Erik Forssén, Sancho McCann, Tristram Southey, Matthew Baumann, Kevin Lai, Bruce Dow, James J. Little, and David G. Lowe

AAAI-07 Mobile Robot Workshop Technical Report, AAI-WS-07-15, Oct 2007.

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## **TECHNICAL SKILLS**

- **Programming Languages:** C/C++, D, Java, MATLAB, Python, SQL
  - **Tools and Frameworks:** OpenCV, Point Cloud Library (PCL), Robot Operating System (ROS), Eclipse plug-in development, GIT, SVN
  - **Operating Systems:** Linux (Ubuntu, Fedora), Windows, OS X
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