

Gunhee Kim

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Pittsburgh PA 15213

RESEARCH INTERESTS Computer Vision, Machine Learning, Data Mining, Robotics

EDUCATION **Carnegie Mellon University**, Pittsburgh, PA USA

Ph.D. in Computer Science Department September 2009 – Current

- Advisor: Prof. Takeo Kanade

M.S. in Robotics, School of Computer Science August 2006 – May 2008

- Thesis: Link Analysis Techniques for Object Modeling and Recognition
- Advisor: Prof. Martial Hebert
- Committee: Prof. Christos Faloutsos

Korea Advanced Institute of Science and Technology, Taejon, Korea

M.S. in Mechanical Engineering March 1999 – August 2001

- Thesis: Formation Control of Multiple Autonomous Mobile Robots with Limited Sensor Information

B.S. in Mechanical Engineering March 1995 – February 1999

- Thesis: 3-D Modeling of Human Organs for Virtual Laparoscope Surgery Using OpenGL

RESEARCH EXPERIENCE **Computer Science and Artificial Intelligence Laboratory (CSAIL),
Massachusetts Institute of Technology**, Cambridge, MA, USA

Visiting scientist February 2009 – June 2009

- Supervisor: Prof. Antonio Torralba (MIT)
- Unsupervised localization of objects in a huge number of images with linear time

Honda Research Institute, Cambridge, MA, USA

Internship September 2008 – January 2009

- Supervisor: Dr. Bernd Heisele (HRI)
- View Invariant Classifiers for 3D Objects

Intel Research Pittsburgh, Pittsburgh, PA, USA

Intel/CMU Summer Fellow May 2008 – August 2008

- Supervisor: Dr. Rahul Sukthankar (Intel), Dr. Shimin Chen (Intel), Prof. Martial Hebert (CMU) and Prof. Christos Faloutsos (CMU)
- Scalable Unsupervised Modeling of Dynamic Image Collections

BimagicLab, Carnegie Mellon University, Pittsburgh, PA, USA

Part-time programmer June 2008 – August 2008

- Supervisor: Prof. Jelena Kovacevic (CMU)
- Implementation of Image Segmentation Algorithms for Biomedical Images

Vision & Mobile Robotics Lab, The Robotics Institute, Pittsburgh, PA, USA

Graduate Research Assistant August 2006 – May 2008

- Supervisor: Prof. Martial Hebert (CMU)
- Statistical Modeling and Recognition of Object Categories by Merging Topic Content with Link Analysis
- Unsupervised Modeling of Object Categories using Graph Mining Techniques
- Ground-based Detection of Stationary Vehicles using LADAR and Imagery

Visiting Researcher April 2005 – July 2006

- Line Features based Indoor Object Recognition for Mobile Robot Navigation

**Intelligent Robotics Research Center,
Korea Institute of Science and Technology(KIST) , Seoul, Korea**

Research Scientist August 2001 – July 2006

- Object Recognition for Indoor Mapping and Navigation Using Stereo Vision
- A Behavior Selection using Generalized Stochastic Petri Nets (GSPNs)
- Robot Navigation in a Highly Populated Environment
- An Optimal Path Planning for Tangible Agents in a Dynamic Environment
- Development of a Science Museum Guide Robot

**Robotics and Simulation Lab,
Korea Advanced Institute of Science and Technology (KAIST) , Taejon, Korea**

Graduate Research Assistant March 1999 – August 2001

- Supervisor: Prof. Doo Yong Lee (KAIST)
- Formation Control of Multiple Mobile Robots
- Development of the Supervisory Controller of High-Speed Train Cars

PUBLICATION - **Gunhee Kim** and Antonio Torralba, "Unsupervised Detection of Regions of Interest using Iterative Link Analysis", *Annual Conference on Neural Information Processing Systems (NIPS 2009)*, Vancouver, Canada, December 7-10, 2009. (**Poster**) (Acceptance = 263/1105 ~ 23.8%)

Bernd Heisele, **Gunhee Kim**, and Andrew Meyer, "Object Recognition with 3D Models", *British Machine Vision Conference 2009 (BMVC 2009)*, London, UK, September 7-10, 2009. (**Poster**) (Acceptance = 95/325 ~ 38%)

Gunhee Kim, Christos Faloutsos, and Martial Hebert, "Unsupervised Modeling of Object Categories Using Link Analysis Techniques," *IEEE Conference on Computer Vision and Pattern Recognition (CVPR 2008)*, Anchorage, USA, June 24-26, 2008. (**Oral**) (Oral Acceptance = 62/1593 ~ 3.9%)

Gunhee Kim, Christos Faloutsos, and Martial Hebert, "Unsupervised Modeling and Recognition of Object Categories with Combination of Visual Contents and Geometric Similarity Links," *ACM International Conference on Multimedia Information Retrieval (ACM MIR 2008)*, Vancouver, Canada, October 30-31, 2008. (**Oral**) (Oral Acceptance = 20/264 ~ 7.6%)

Gunhee Kim, Daniel Huber, and Martial Hebert, "Segmentation of Salient Regions in Outdoor Scenes using Imagery and 3-D Data," *IEEE Workshop on Application of Computer Vision (WACV 2008)*, Colorado, USA, January 7-9, 2008. (**Oral**)

Gunhee Kim, Martial Hebert, and Sung-Kee Park, "Preliminary Development of a Line Feature-based Object Recognition System for Textureless Indoor Objects," *Springer-LNCIS Publication "Recent Progress in Robotics: Viable Robotic Service to Human"* (One of 30 Selected papers from the *2007 International Conference on Advanced Robotics (ICAR 2007)*), 2008.

REFEREED
JOURNAL
(SELECTED)

Gunhee Kim and Woojin Chung, "Navigation Behavior Selection Using Generalized Stochastic Petri Nets (GSPN) for a Service Robot," *IEEE Transactions on Systems, Man and Cybernetics Part C (SCI)*, vol.37, no.4, July 2007.

Woojin Chung, **Gunhee Kim**, and Munsang Kim, "Development of Multi-Functional Indoor Service Robot PSR Systems," *Autonomous Robots (SCI)*, vol.22, no.1, pp. 1-17, January 2007.

Gunhee Kim and Woojin Chung, "Tripodal Schematic Control Architecture for Integration of Multi-Functional Indoor Service Robots," *IEEE Transactions on Industrial Electronics (SCI)*, vol.53, no.5, pp. 1723- 1736, October 2006.

REFEREED
CONFERENCE
(SELECTED)

Gunhee Kim, Woojin Chung, Sung-Kee Park, and Munsang Kim, "Experimental Research of Navigation Primitive Selection Using Generalized Stochastic Petri Nets (GSPNs) for a Tour-Guide Robot," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2005)*, pp.1392-1398, Alberta, Canada, August 2-6, 2005.

Gunhee Kim, Woojin Chung, and Munsang Kim, "A Selection Framework of Multiple Navigation Primitives Using Generalized Stochastic Petri Nets," *IEEE International Conference on Robotics and Automation (ICRA 2005)*, pp.3801-3806, Barcelona, Spain, April 18-22, 2005.

Gunhee Kim, Woojin Chung, Sangmok Han, Kyung-Rock Kim, Munsang Kim, and Richard H. Shinn, "The Autonomous Tour-Guide Robot Jinny," *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2004)*, pp.3450-3455, Sendai, Japan, September 28 - October 2, 2004.

Gunhee Kim, Woojin Chung, Munsang Kim, and Chongwon Lee, "Implementation of Multi-Functional Service Robots Using Tripodal Schematic Control Architecture," *2004 IEEE International Conference on Robotics and Automation (ICRA 2004)*, pp.4005-4010, New Orleans, LA, USA, April 26-May 1, 2004.

Woojin Chung, **Gunhee Kim**, Munsang Kim, and Chongwon Lee, "Integrated Navigation System for Indoor Service Robots in Large-scale Environments," *IEEE International Conference on Robotics and Automation (ICRA 2004)*, pp.5099-5104, New

Orleans, LA, USA, April 26-May 1, 2004.

Gunhee Kim, Woojin Chung, Munsang Kim, and Chongwon Lee, "Tripodal Schematic Design of the Control Architecture for the Service Robot PSR," *IEEE International Conference on Robotics and Automation (ICRA 2003)*, pp.2792-2797, Taipei, Taiwan, September 15-18, 2003.

Gunhee Kim, Woojin Chung, Munsang Kim, and Chongwon Lee, "Design and Implementation of Tripodal Schematic Control Architecture for Multi-Functional Service Robots," *International Conference on Control, Automation, and Systems (ICCAS 2003)*, pp. 2045-2050, Gyeongju, Korea, October 22-25, 2003. (**Outstanding Paper Award**)

PROFESSIONAL
ACTIVITIES

Seminar Talks (selected)

- *Link Analysis Techniques for Object Modeling and Recognition*, New York University, February 11, 2008.
- *Link Analysis Techniques for Object Modeling and Recognition*, MIT CSAIL Vision Reading Group, February 10, 2008.
- *Unsupervised Modeling of Object Categories Using Link Analysis Techniques*, Carnegie Mellon Database Seminar, May 5, 2008.
- *Link Analysis Techniques for Object Modeling and Recognition*, Computer Vision Misc Reading Group, CMU, April 16, 2008.

Conference Talks (selected)

- *Unsupervised Modeling and Recognition of Object Categories with Combination of Visual Contents and Geometric Similarity Links*, ACM MIR, October 31, 2008.
- *Unsupervised Modeling of Object Categories Using Link Analysis Techniques*, CVPR, June 24, 2008.
- *Segmentation of Salient Regions in Outdoor Scenes Using Imagery and 3-D Data*, WACV, January 8, 2008.
- *Preliminary Development of a Line Feature-based Object Recognition System for Textureless Indoor Objects*, ICAR, August 23, 2007.

Posters (selected)

- *Scalable Unsupervised Modeling of Dynamic Image Collections*, Intel Research Pittsburgh Open House, October 28, 2008.

(Last Update: August 25, 2009)