

Gunhee Kim

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RESEARCH INTERESTS Computer vision, Machine learning, Data mining, Robotics

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

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 and Marius Leordeanu

Korea Advanced Institute of Science and Technology, Taejon, Korea

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

- Thesis: Formation Control of Multiple Autonomous Mobile Robots with Limited Sensor Information
- Advisor: Prof. Doo Yong Lee

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

- Thesis: 3-D Modeling of Human Organs for Virtual Laparoscope Surgery Using OpenGL
- Advisor: Prof. Dong-Soo Kwon

RESEARCH EXPERIENCE **Intel Research Pittsburgh**, Pittsburgh, PA, USA

Intel/CMU Summer Fellow May 2008 – August 2008

- Big Video Project

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

Graduate Research Assistant August 2006 – Current

- Statistical Modeling and Recognition of Object Categories
- 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

- 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 a stereo vision
- A behavior selection using Generalized Stochastic Petri Nets (GSPN's)
- Robot navigation in a highly populated environment
- An optimal path planning for tangible agents in a dynamic environment
- Development of Science Museum Guide Robots

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

Graduate Research Assistant March 1999 – October 1999

- Formation Control of Multiple Mobile Robots
- Development of the Supervisory Controller of the High-Speed Train Car

AWARDS

Graduate Fellowship (Full Financial Support) for the entire course of MS study from the Robotics Institute, August 2006 - May 2008

Outstanding paper award, 2003 International Conference on Control, Automation and System (ICCAS2003), October 24, 2003 (Four papers awarded among 540 papers)

The Citation from Taejon Welfare Center for the Disabled, December 1996

Full Scholarship for the entire course of BS and MS study from KAIST, March 1995 - February 2001

Merit-based Scholarship, KAIST, March 1996 - February 1999

PUBLICATION AT
CMU

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 = 63/1593 ~ 4%)

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"* S. Lee, I. Hong Suh, M. Sang Kim (eds.) (One of 30 Selected papers from the 2007 International Conference on Advanced Robotics (ICAR 2007)), 2008.

REFEREED
JOURNAL

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.

Gunhee Kim, Woojin Chung, and Munsang Kim, "Development of Range Sensor Based Integrated Navigation System for Indoor Service Robot ", *Journal of Control,*

Automation, and Systems Engineering, vol.10, no.9, pp.785-798, October, 2004. (in Korean)

Gunhee Kim, Doo Yong Lee, and Kyungno Lee, "Formation of Mobile robots with Inaccurate Sensor Information", *Transactions on Control, Automation and Systems Engineering*, vol.3 no.4 pp.203-209, 2001.

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!!**

Gunhee Kim, Doo Yong Lee, and Kyungno Lee, "Formation Approach for Mobile robots with Inaccurate Sensor Information", *International Conference on Control, Automation, and Systems (ICCAS 2001)*, pp.805-808, Jeju, Korea, October 17-21, 2001.

PROFESSIONAL
ACTIVITIES

Seminar Talks

- *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)

CVPR 2008, WACV 2008, ICAR 2007, IROS 2005, IROS 2004, ICRA 2004, ICRA 2003

Reviewer (selected)

IEEE SMC, ICRA 2005, ICAR 2005, IROS 2005

INDUSTRIAL-
IZATION

Guide Service Robot *Jinny*. Technology transfer agreement with Hyundai Heavy Industry. Dec. 2003. (The first prototype is working at the National Science Museum of Korea)

SKILLS

Software

- OS: MS-Windows, DOS, Linux (with Real-Time Kernel).
- Programming: Extensive experience on Matlab, gcc, and MS Visual Studio. Fluency in Java and Python.

Hardware

- Integration and control of several large-scale robot platforms.
- Evolution Robotics ERSP & Scorpion.
- Sensors: Videre design stereo camera, SICK laser range finder LMS200, Hokuyo IR scanner, Tamagawa Optical Fiber Gyro, Ultrasonic sensors.
- Motion controllers: Delta Tau PMAC boards, other specialized controllers.

PERSONAL
INFORMATION

Citizenship: South Korea (Republic of Korea)

REFERENCES

Available upon request

(Last Update: July 2, 2008)