Junghwan Lee

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Korea Institute of Science and Technology
Hwarangno 14-gil 5, Seongbuk-gu,
Seoul, 136-791, South Korea

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Education

Ph.D., Computer Science 03/2006 – 08/2014
- Thesis: Sampling-based motion planning algorithm to handle a narrow passage problem
- Advisor: Prof. Sung-eui Yoon
- Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea

B.S., Computer Science 03/2001 – 02/2006
- Yonsei University, Seoul, South Korea

Research Interests

Robot automation, robot motion and path planning, manipulator / autonomous vehicle planning

Professional Experiences

Post-Doctoral 09/2014 – present
Interaction & Robotics Research Center, KIST (Korea Institute of Science and Technology), Seoul, South Korea

Research Assistant 03/2006 – 02/2007, 03/2008 – 08/2014
Scalable Graphics/Geometric Algorithm Lab., KAIST

Teaching Assistant 03/2008 – 08/2013
Introduction to Programming, Computer Graphics, Dept. Computer Science, KAIST

Visiting Researcher 07/2009
State Key Lab of CAD & CG, Zhejiang University, China

Undergraduate Research Assistant 09/2005 – 12/2005
LG CDMA-Yonsei Univ. joint Project

Internship 09/2004 – 08/2005
Samsung Electronics Software membership, Seoul, South Korea

Publications

1. Selective retraction-based RRT planner for various environments
   Junghwan Lee, OSung Kwon, Liangjun Zhang, and Sung-eui Yoon
   IEEE Transactions on Robotics (TRO), Aug. 2014

2. Cloud RRT*: Sampling Cloud based RRT*
   Donghyuk Kim, **Junghwan Lee** and Sung-Eui Yoon
   IEEE International Conference on Robotics and Automations (ICRA), 2014

3. PROT: Productive Regions-Oriented Task space path planning for hyper-redundant manipulators
   Junghwan Lee and Sung-Eui Yoon
   IEEE International Conference on Robotics and Automations (ICRA), 2014

4. VLSH: Voronoi-based Locality Sensitive Hashing
   Tieu Lin Loi, Jae-Pil Heo, **Junghwan Lee** and Sung-Eui Yoon
   IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2013

5. Scheduling in Heterogeneous Computing Environments for Proximity Queries
   Duksu Kim, Jinkyu Lee, **Junghwan Lee**, InSik Shin, John Kim, Sung-eui Yoon
   IEEE Transactions on Visualization and Computer Graphics (TVCG), Sept. 2013

6. SR-RRT: Selective Retraction-based RRT Planner
   Junghwan Lee, OSung Kwon, Liangjun Zhang, and Sung-eui Yoon
   IEEE International Conference on Robotics and Automations (ICRA), 2012

Patents

1. Motion planning apparatus and method based on sampling clouds
   Sung-eui Yoon, Donghyuk Kim, **Junghwan Lee**
   South Korea (Patent Pending), 2015

2. Motion planning apparatus and method based on random sampling using selective tracking
   Sung-eui Yoon**, Junghwan Lee**, OSung Kwon, Liangjun Zhang
   South Korea (Patent Number 10-1356873), 2014

3. Proximity Query Process Accelerating System
   Sung-eui Yoon, Duksu Kim, **Junghwan Lee**, Jinkyu Lee, InSik Shin, John Kim
   PCT (Patent Pending), 2014

4. Proximity Query Process Accelerating System
   Sung-eui Yoon, Duksu Kim, **Junghwan Lee**, Jinkyu Lee, InSik Shin, John Kim
   South Korea (Patent Pending), 2013

Professional Activities

(Served as) Referee for:

- IEEE Int. Conf. on Robotics and Automations (ICRA)
- IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS)
- IEEE Transaction on Visualization and Computer Graphics (TVCG)

(Selected) Research Projects

Content Creation Tool for Image-based Mixed Reality in Samsung Light-field Camera 10/2013 – 08/2014
Development of mixed reality system based from depth and color maps
Samsung Electronics

Simple Light Field 3D Rendering Technique 08/2012 – 07/2013
Development of random-accessible light-fields algorithm
Samsung Electronics

Development of Real-time Physics Simulation Engine for e-Entertainment 03/2010 – 02/2013
Development parallel collision detection algorithm for heterogeneous GPU
Institute for Information Technology Advancement
(now National IT Industry Promotion Agency)

Physics-assisted Data-driven Real-time Character Animation Technique 07/2007 – 06/2009
Development image-based 3D re-construction and rendering of objects and surface of fluid
Korea Research Foundation (now National Research Foundation)

Awards/Honors

1. **Outstanding Ph.D. thesis award in Computer Science, KAIST, 2015**
   Sampling-based motion planning algorithm to handle a narrow passage problem

2. **Spotlight paper**, **IEEE Transactions on Visualization and Computer Graphics, Sep. 2013**
   Duksu Kim, Jinkyu Lee, **Junghwan Lee**, Insik Shin, John Kim , Sung-Eui Yoon

3. **5th place at Hyundai Autonomous Vehicle Competition, 2012**
   Team EURECAR, KAIST

4. **Outstanding teaching assistant award, KAIST, 2011 & 2012**
   Introduction to Programming

5. **LG-CDMA scholarship, 2005**

Programming Experiences

C/C++, Python, CUDA, QT, OpenGL