Daeun Song

Computer Science and Engineering · Robotics

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Research Interests

Robot Path and Motion Planning, Computational Geometry

Education

Ewha Womans University, Seoul, Korea

2017 - Current | **M.S. and Ph.D combined in Computer Science and Engineering**

- Advisor : Professor Young J. Kim
- Graduate student representative of CSE department in 2020

Ewha Womans University, Seoul, Korea

2013 - 2017 | **B.S. in Computer Science and Engineering**

Experience

LAAS-CNRS, Toulouse, France

JUN 2019 - SEP 2019 | **Gepetto Team, Summer Internship [C03]**

- Worked on multi-contact planner for legged robots on uneven terrain, SL1M.
- Implemented a module that generates a set of possible contact surfaces using a guide-path result from hpp-rbprm in Python.

Ewha Womans University, Seoul, Korea

JAN 2016 - FEB 2017 | **Computer Graphics Lab, Undergraduate Research [J01]**

- Worked on rendering an astronaut model with the physics-based character animation under reduced gravity.
- Developed under Motion Builder and 3dsMax with V-ray.

MAR 2016 - DEC 2016 | **"SSK, the drawing robot", the Graduation Project [W01], [P01], [H04, H05, H06]**

- Developed a robotic application to reproduce the user's input drawing from a tablet PC on an arbitrary surface. Worked on the robot part.
- Implemented under Sunrise OS based on Java, using KUKA LBR IIWA 7 R800, manipulator.
- Lead the team composed of three undergraduate students.

Patents

[P01] **Daeun Song**, Jungmin Kim, "Robotic apparatus and method for artistic pen drawing on an arbitrary surface," Korean intellectual Property Office, 1019356400000

Publications

International Journals

[J02] **Daeun Song**, Pierre Fernbach, Thomas Flayols, Andrea Del Prete, Nicolas Mansard, Steve Tonneau, Young J. Kim, **"Solving Footstep Planning as a Feasibility Problem using L1-norm Minimization"**, (Under Review). Webpage / Paper / Video

[J01] Yun-Hyeong Kim, Taesoo Kwon, **Daeun Song**, Young J. Kim, **"Full-body Animation of Human Locomotion in Reduced Gravity using Physics-based Control"**, IEEE Computer Graphics and Applications (CG&A)*, Vol. 37, No. 6, Nov/Dec 2017, pp.28-39 (Special issue on Modeling Virtual Humans). Webpage / Paper / Video

International Conference Papers

[C04] Jason Chemin, Pierre Fernbach, **Daeun Song**, Nicolas Mansard, Steve Tonneau, **"Learning to steer a locomotion contact planner"**, (Under Review).

[C03] Steve Tonneau, **Daeun Song**, Pierre Fernbach, Nicolas Mansard, Michel Taix, Andrea Del Prete, **"SL1M: Sparse L1-norm Minimization for contact planning on uneventerrain"**, IEEE International Conference on Robotics and Automation (ICRA), Jun 2020. Paper / Video

[C02] **Daeun Song**, Young J. Kim, **"Distortion-free Robotic Surface-drawing using Conformal Mapping"**, IEEE International Conference on Robotics and Automation (ICRA), May 2019. Webpage / Paper / Video **[H09]**

[C01] **Daeun Song**, Taekhee Lee, Young J. Kim, **"Artistic Pen Drawing on an Arbitrary Surface using an Impedance-controlled Robot"**, IEEE International Conference on Robotics and Automation (ICRA), May 2018. Webpage / Paper / Video **[H08]**

Domestic Conference Papers

[D02] **Daeun Song**, Young J. Kim, "Distortion-free Robotic Surface-drawing using Conformal Mapping (extended abstract of [C02])", Korea Robotics Society Annual Conference (KRoC), Aug 2020.

[D01] **Daeun Song**, Taekhee Lee, Young J. Kim, "Artistic Pen Drawing on an Arbitrary Surface using an Impedance-controlled Robot (extended abstract of [C01])", Korea Robotics Society Annual Conference (KRoC), Jan 2018. **[H07]**

Workshops and Tutorials

[W02] **Daeun Song**, Young J. Kim, "Hi-fidelity Robotic Pen Drawing on a Bumpy Surface", IEEE International Conference on Robotics and Automation (ICRA) Robots and Art Forum, May 2018.

[W01] **Daeun Song**, Taekhee Lee, Jungmin Kim, Sungmin Sohn, Young J. Kim, "Artistic Pen Drawing on an Arbitrary Surface using an Impedance-controlled Robot", IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) Workshop on Artistically Skilled Robots, Oct 2016.

* : SCI (Science Citation Index)-listed journals

Technical Skills

Programming Languages: C/C++, Python, Java, Matlab, HTML/CSS

Robotic Programming: ROS, Sunrise Workbench for KUKA

Robotic Planner and Simulator: OMPL, HPP, MoveIt!, Gazebo, V-REP

Robotic Hardware: KUKA iiwa 7 R800, Ridgeback mobile platform, Fetch mobile manipulator

Others: Experienced with Gurobi, OpenCV, OpenGL, PCL

Honors & Awards

[H10] **Solvay Korea Scholarship Award** | Outstanding Academic Performance
[H09] **RAS Travel Award** | International Conference on Robotics and Automation (ICRA 2019)
[H08] **RAS Travel Award** | International Conference on Robotics and Automation (ICRA 2018)
[H07] **Best Paper Award** | The 13th Korea Robotics Society Annual Conference (KRoC 2018)
[H06] **Participation Award** | Hanium Expo Contest
[H05] **Special Award** | Capston Awards (Engineering Education Festa 2016)
[H04] **1st Place** | Ewha Engineering Capstone Design Contest
[H03] **1st Place** | Ewha Engineering Student Portfolio Contest
[H02] **2nd Place** | Ewha Power ProgrammER(E-PPER) Contest
[H01] **Excellence Award** | Excellent Tutee in Tutoring Program

Activities

Talks & Demos

- **TALK** | The 5th NZ/KOREA Workshop on HDI4D *NOV 2017*
- **DEMO** | Drawing robot demo, Engineering Education Festa 2016 *NOV 2016*
- **DEMO** | Drawing robot demo, Hanium Expo 2016 *NOV 2016*

School Activities

- **Teaching Assistant** | Computer Programming Class *MAR 2016 - JUN 2016*
- **Student Club** | Ewha DO Coding(EDOC), Computer Programming Club *JAN 2016 - DEC 2016*
- **Summer School** | EWHA-EPITA Sumer School, Paris, France *NOV 2016*

Others

- **Tutorial** | Participate, Reinforcement Learning Tutorial *JAN 2017*
- **Tutorial** | Participate, Arduino & IoT Sensing and Wireless Communication Control Tutorial *JAN 2016*