

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

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| <i>2017 -</i>
Current | M.S. and Ph.D combined in Computer Science and Engineering <ul style="list-style-type: none">• Advisor : Professor Young J. Kim• Graduate student representative of CSE department in 2020• Expecting to graduate in FEB 2023 |
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Ewha Womans University, Seoul, Korea

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| <i>2013 - 2017</i> | B.S. in Computer Science and Engineering |
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Research Experience

LAAS-CNRS, Toulouse, France

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| <i>JUN 2019</i>
- <i>SEP 2019</i> | Gepetto Team, Summer Internship [J02], [C03] <ul style="list-style-type: none">• Supervised under Steve Tonneau.• 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. |
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Ewha Womans University, Seoul, Korea

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| <i>JAN 2021</i>
- DEC 2021 | “Large-scale Robotic Drawing System”, ITRC Project [J03], [D03], [H10] <ul style="list-style-type: none">• Worked on a large-scale robotic drawing system that draws a pen drawing on a large surface.• Implemented under ROS in C++ and Python using KUKA LBR IIWA 7 R800 as a manipulator and Clearpath Robotics Ridgeback as a mobile platform.• Lead the team composed of two undergraduate students and myself. |
| <i>JAN 2016</i>
- <i>FEB 2017</i> | “SSK, the drawing robot”, Graduation Project [P01], [H03, H06, H07] <ul style="list-style-type: none">• 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 Workbench in Java, using KUKA LBR IIWA 7 R800, manipulator.• Lead the team composed of three undergraduate students including myself. |
| <i>JAN 2016</i>
- <i>FEB 2017</i> | Computer Graphics Lab, Undergraduate Research [J01] <ul style="list-style-type: none">• Worked on rendering an astronaut model mapping the physics-based character animation under reduced gravity.• Developed under Motion Builder and 3dsMax with V-ray. |

Publications

International Journals

- [J03] **Daeun Song**, Jiyeon Kim, Young J. Kim, “**SSK: Robotic Pen-art System for Large, Non-planar Canvas**”, under review.
- [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**”, IEEE Robotics and Automation Letters (RA-L)*, 6(3), July 2021. [🏠](#) [📺](#) [📄](#)
- [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)*, (Special issue on Physically Based Animation), 37(6), Nov/Dec 2017. [🏠](#) [📺](#) [📄](#)

International Conference Papers

- [C06] Ivaylo Ilinkin, **Daeun Song**, Young J. Kim, “**Stroke-based Rendering and Planning for Robotic Performance of Artistic Drawing**”, under review.
- [C05] **Daeun Song**, Eunjung Lim, Jiyeon Park, Minjung Jung, Young J. Kim, “**TSP-Bot: Robotic TSP Pen Art using High-DoF Manipulators**”, under review. [🏠](#)
- [C04] Jason Chemin, Pierre Fernbach, **Daeun Song**, Guilhem Saurel, Nicolas Mansard, Steve Tonneau, “**Learning to steer a locomotion contact planner**”, IEEE International Conference on Robotics and Automation (ICRA), May 2021. [📄](#)
- [C03] Steve Tonneau, **Daeun Song**, Pierre Fernbach, Nicolas Mansard, Michel Taix, Andrea Del Prete, “**SLIM: Sparse L1-norm Minimization for contact planning on uneven terrain**”, IEEE International Conference on Robotics and Automation (ICRA), May 2020. [🏠](#) [📺](#) [📄](#)
- [C02] **Daeun Song**, Young J. Kim, “**Distortion-free Robotic Surface-drawing using Conformal Mapping**”, IEEE International Conference on Robotics and Automation (ICRA), May 2019. [🏠](#) [📺](#) [📄](#) [\[H08\]](#)
- [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. [🏠](#) [📺](#) [📄](#) [\[H07\]](#)

Domestic Conference Papers

- [D04] **Daeun Song**, Young J. Kim, “Robotic Pen-art System for Large, Non-planar Canvas (extended abstract of [J03])”, Korea Computer Graphics Society Annual Conference (KCGS), Jul 2022.
- [D03] Eunjung Lim, Jiyeon Kim, **Daeun Song**, Young J. Kim, “TSP Pen Art using a Mobile Collaborative Robot (extended abstract)”, Korea Computer Graphics Society Annual Conference (KCGS), Jul 2021. [🏠](#) [📺](#) [\[H10 - Best Undergrad Paper Award\]](#)
- [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. [\[H06 - Best Paper Award\]](#)

* : SCI (Science Citation Index)-listed journals

Patents

- [P01] Young J. Kim, **Daeun Song**, Jungmin Kim, “Robotic apparatus and method for artistic pen drawing on an arbitrary surface,” Korean intellectual Property Office, 1019356400000

Technical Skills

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

Robotic Hardware: KUKA iiwa 7 R800 manipulator, UR5e dual arm w/ Robotiq 3F gripper, Ridgeback mobile platform, Fetch mobile manipulator, Turtlebot3

Robotic Programming: ROS, Sunrise Workbench for KUKA

Robotic Planner and Simulator: OMPL, HPP, MoveIt!, Gazebo, CoppeliaSim

Others: Experience with OpenGL, OpenCV, PCL, Gurobi

Honors & Awards

- [H10] **Best Undergrad Paper Award** | Korea Computer Graphics Society Annual Conference (KCGS 2021)
- [H09] **Solvay Scholarship Award** | Outstanding Academic Performance (2019 - 2020)
- [H08] **RAS Travel Award** | International Conference on Robotics and Automation (ICRA 2019)
- [H07] **RAS Travel Award** | International Conference on Robotics and Automation (ICRA 2018)
- [H06] **Best Paper Award** | The 13th Korea Robotics Society Annual Conference (KRoC 2018)
- [H05] **Participation Award** | Hanium Expo Contest 2016
- [H04] **Special Award** | Capston Awards (Engineering Education Festa 2016)
- [H03] **1st Place** | Ewha Engineering Capstone Design Contest 2016
- [H02] **1st Place** | Ewha Engineering Student Portfolio Contest 2016
- [H01] **2nd Place** | Ewha Power ProgrammER(E-PPER) Contest 2016

Activities

Academic

- **Teaching Assistant** | Numerical Methods Class *Spring 2022*
- **Teaching Assistant** | Computer Programming Class *Spring 2016*

Talks & Demos

- **DEMO** | Drawing simulation demo, ITRC Forum 2022 *APR 2022*
- **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*

Others

- **Summer School** | Participate, AI & Robotics Summer School 2020 *AUG 2020*
- **Tutorial** | Participate, Reinforcement Learning Tutorial *JAN 2017*
- **Tutorial** | Participate, Arduino & IoT Sensing and Wireless Communication Control Tutorial *JAN 2016*
- **Summer School** | Participate, EWHA-EPITA Sumer School, Paris, France *JUL 2015*