Daeun Song

Computer Science and Engineering · Robotics

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Research Interests

Robot Path and Motion Planning, Computational Geometry, Machine Learning

Education

Ewha Womans University, Seoul, Korea

2017 - 2023 | **Ph.D in Computer Science and Engineering**

- Advisor : Young J. Kim
- Dissertation : "Artistic Robotic Pen Drawing System using High-DoF Manipulators"
- Graduate student representative of CSE department in 2020

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

Research Experience

University of Maryland, MD, USA

AUG 2023 - Present | **GAMMA, Postdoctoral Associate [H11]**

- Advisor Dinesh Manocha.

Ewha Womans University, Seoul, Korea

MAR 2023 - JUN 2023 | **Graphics Lab, Postdoctoral Researcher**

- Advisor: Young J. Kim

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

- Advisor: Young J. Kim

LAAS-CNRS, Toulouse, France

JUN 2019 - SEP 2019 | **Gepetto Team, Summer Internship [J02], [C03]**

- Advisor: Steve Tonneau.

Publications

International Journals

[J03] **D. Song**, J. Kim, Y. J. Kim, **SSK: Robotic Pen-art System for Large, Non-planar Canvas**, *IEEE Transactions on Robotics (T-RO)**, 39(4), Aug. 2023.

[J02] **D. Song**, P. Fernbach, T. Flayols, A. D. Prete, N. Mansard, S. Tonneau, Y. 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] Y.-h. Kim, T. Kwon, **D. Song**, Y. 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] **D. Song**, E. Lim, J. Park, M. Jung, Y. J. Kim, **TSP-Bot: Robotic TSP Pen Art using High-DoF Manipulators**, *under review.*

[C05] I. Ilinkin, **D. Song**, Y. J. Kim, **Stroke-based Rendering and Planning for Robotic Performance of Artistic Drawing**, *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Oct 2023.

[C04] J. Chemin, P. Fernbach, **D. Song**, G. Saurel, N. Mansard, S. Tonneau, **Learning to steer a locomotion contact planner**, *IEEE International Conference on Robotics and Automation (ICRA)*, May 2021.

[C03] S. Tonneau, **D. Song**, P. Fernbach, N. Mansard, M. Taix, A. D. Prete, **SL1M: Sparse L1-norm Minimization for contact planning on uneventerrain**, *IEEE International Conference on Robotics and Automation (ICRA)*, May 2020.

[C02] **D. Song**, Y. J. Kim, **Distortion-free Robotic Surface-drawing using Conformal Mapping**, *IEEE International Conference on Robotics and Automation (ICRA)*, May 2019. **[H08]**

[C01] **D. Song**, T. Lee, Y. 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] **D. Song**, Y. 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] E. Lim, J. Kim, **D. Song**, Y. J. Kim, TSP Pen Art using a Mobile Collaborative Robot (extended abstract of [C05]), *Korea Computer Graphics Society Annual Conference (KCGS)*, Jul 2021. **[H10 - Best Undergrad Paper Award]**

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

[D01] **D. Song**, T. Lee, Y. 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] Y. J. Kim, **D. Song**, J. 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, OMPL, HPP, MoveIt!, CoppeliaSim, Isaac Sim

Others: Experience with OpenGL, OpenCV, PCL, PyTorch, Tensorflow

Honors & Awards

[H11] **MRC Postdoctoral Fellowship** | Maryland Robotics Center, University of Maryland (2023-2024))
[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** | Introduction to Physically-based Animation (Graduate) *Spring 2023*
- **Teaching Assistant** | Numerical Methods (Undergrad) *Spring 2022*
- **Teaching Assistant** | Computer Programming (Undergrad) *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*