

Dongho Kang

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RESEARCH INTERESTS

My research aims to create a legged robot that produces natural and animal-like motion. Thus, my research interests are broad ranging to legged locomotion control, computational model of character animation and design optimization for robotics applications.

EDUCATION

ETH Zürich, Zurich, Switzerland

- Doctoral Student in Computer Science Apr 2020 – Present
 - Main advisor: Prof. Dr. Stelian Coros
 - Second advisor: Prof. Dr. Marco Hutter

- M.Sc. ETH in Mechanical Engineering Sep 2016 – Aug 2019
 - Advisor: Prof. Dr. Marco Hutter
 - Graduated with distinction

Seoul National University, Seoul, South Korea

- B.Sc. in Mechanical Engineering and B.Sc. in Computer Science Mar 2009 – Aug 2016
 - Advisor: Prof. Dr. Dongjun Lee
 - Graduated with honor (Cum Laude)

RESEARCH EXPERIENCE

Computational Robotics Lab, ETH Zürich

- Scientific Assistant Dec 2019 – Present
 - Supervisors: Prof. Dr. Stelian Coros
 - Aim to build bio-inspired quadrupedal robots that perform more natural and animal-like motion.

Robotic Systems Lab, ETH Zürich

- Master's Student Sep 2017 – Nov 2019
 - Supervisors: David Höller, Dr. Jemin Hwangbo and Prof. Dr. Marco Hutter
 - Conducted the research on learning-based collision avoidance for a legged robot ANYmal.
 - Participated in the development of RaiSim: a physics engine for robotics and AI research.

Interactive & Networked Robotics Lab, Seoul National University

- Undergraduate Research Assistant Sep 2014 – Jan 2016
 - Supervisors: Prof. Dr. Dongjun Lee
 - Participated in the research on state estimation and control strategy for multi-robot cooperative systems

PROFESSIONAL AFFILIATIONS & ACTIVITIES

NVIDIA, Zurich, Switzerland

- Deep Learning Intern Jun 2018 – Dec 2018
 - Projects: Super-Resolution and Anti-aliasing methods based on deep learning.

LeisureQ Inc., Seoul, South Korea

- Web Developer Intern Jan 2016 – Sep 2016
 - Projects: Backend web application for E-commerce website Gajago: <http://www.thegajago.com>

CNP Technology Inc., Seoul, South Korea

- Hardware and CAD Engineer Jan 2016 – Sep 2016

PUBLICATIONS

CONFERENCES

- [1] Dongho Kang, Flavio De Vincenti, Naomi C. Adam, and Stelian Coros, “Animal Motions on Legged Robots Using Nonlinear Model Predictive Control,” in *International Conference on Intelligent Robots and Systems (IROS)*, Oct 2022 (accepted).
- [2] Dongho Kang, Simon Zimmermann, and Stelian Coros, “Animal Gaits on Quadrupedal Robots using Motion Matching and Model-Based Control,” in *International Conference on Intelligent Robots and Systems (IROS)*, Sep 2021.
- [3] Flavio De Vincenti, Dongho Kang, and Stelian Coros, “Control-Aware Design Optimization for Bio-Inspired Quadruped Robots,” in *International Conference on Intelligent Robots and Systems (IROS)*, Sep 2021.

- [4] Changu Kim, Hyunsoo Yang, Dongho Kang and Dongjun Lee, “2-D Cooperative Localization with Omni-Directional Mobile Robots,” in *International Conference on Ubiquitous Robots and Ambient Intelligence*, Goyang, South Korea, Oct 2015.

WORKSHOP

- [1] Dongho Kang, Flavio De Vincenti, and Stelian Coros, “Nonlinear Model Predictive Control for Quadrupedal Locomotion Using Second-Order Sensitivity Analysis,” in *ICRA 2022: 6th Full-Day Workshop on Legged Robots*, May 2022.

THESIS

- [1] Dongho Kang, “End-to-End Collision Avoidance from Depth Input with Memory-based Deep RL,” Master’s thesis, the Department of Mechanical and Process Engineering, ETH Zürich, Aug 2019.

INVITED TALK	<ul style="list-style-type: none"> ▪ Robot Intelligence Lab, Korea University, Seoul, South Korea Apr 2021 ▪ NAVER LABS Corp., Seoul, South Korea Dec 2019 ▪ Max Planck ETH Center for Learning Systems Symposium, Tübingen, Germany Feb 2019
AWARDS & SCHOLARSHIPS	<ul style="list-style-type: none"> ▪ Birkigt Scholarship, ETH Zürich Feb 2018 Stipendiary scholarship for international master student. ▪ Eminence Scholarship, Seoul National University Aug 2014 Full-tuition scholarship for one academic semester for outstanding academic performance. ▪ Merit-based Scholarship, Seoul National University Feb 2014 Half-tuition scholarship for one academic semester for outstanding academic performance. ▪ Development Fund Scholarship, Seoul National University Feb 2010 Full-tuition scholarship for one academic year for outstanding academic performance.
TEACHING EXPERIENCE	<p>ETH Zürich, Zurich, Switzerland</p> <ul style="list-style-type: none"> ▪ Teaching Assistant, Linear Algebra (Autumn) 2022 ▪ Teaching Assistant, Computational Models of Motion (Spring) 2021 – 2022 ▪ Teaching Assistant, Visual Computing (Autumn) 2020 – 2022 <p>Seoul National University, Seoul, South Korea</p> <ul style="list-style-type: none"> ▪ Mentor, SNU Samsung Convergence Software Course Program Jan 2015 – Dec 2015 ▪ Teaching Assistant, MAE 446.204A: Dynamics Jan 2014 – Dec 2014 ▪ Teaching Assistant, PA 034.013: Basic Physics 2 Sep 2011 – Dec 2011
LANGUAGES	<ul style="list-style-type: none"> ▪ Korean: Native language. ▪ English: Fluent.
TECHNICAL SKILLS	<p>Programming and Software C/C++, C#, Python, Matlab/Octave, Unix/Linux, Tensorflow, Pytorch, ROS, Open Dynamics Engine, Unity</p> <p>Experience with Robots UnitreeRobotics Aliengo, A1, Go1, ANYbotics ANYmal</p>
REFERENCES	<ul style="list-style-type: none"> ▪ Prof. Dr. Stelian Coros Associate Professor in the Department of Computer Science ETH Zürich Stampfenbachstrasse 48 (Sumatrastrasse 11), 8092, Zurich, Switzerland scoros@inf.ethz.ch • +41 44 632 02 15 ▪ Prof. Dr. Marco Hutter Associate Professor in the Department of Mechanical and Process Engineering ETH Zürich Leonhardstrasse 21, 8092 Zurich, Switzerland mahutter@ethz.ch • +41 44 632 74 17

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- **Prof. Dr. Dongjun Lee**
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