

Dongho Kang

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RESEARCH INTERESTS

My research aims to create legged robots that exhibit natural and animal-like behaviors. Thus, my research interests are broad ranging to legged locomotion control, 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
 - Supervisor: Prof. Dr. Stelian Coros
 - Control methods for animal-like motions of bio-inspired quadrupedal robots.

Robotic Systems Lab, ETH Zürich

- Master's Student Sep 2017 – Nov 2019
 - Supervisors: David Höller, Dr. Jemin Hwangbo and Prof. Dr. Marco Hutter
 - Learning-based collision avoidance for a legged robot.
 - 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
 - State estimation and control strategies for multi-robot cooperative systems

PROFESSIONAL AFFILIATIONS & ACTIVITIES

NVIDIA, Zurich, Switzerland

- Deep Learning Intern Jun 2018 – Dec 2018
 - Projects: Deep learning-based super-resolution and anti-aliasing.

LeisureQ Inc., Seoul, South Korea

- Software Engineer Intern Jan 2016 – Sep 2016
 - Projects: Backend web application for E-commerce website Gajago.

CNP Technology Inc., Seoul, South Korea

- Hardware and CAD Engineer Jan 2016 – Sep 2016

PUBLICATIONS

JOURNALS

- [1] Dongho Kang, Jin Cheng, Miguel Zamora, Fatemeh Zargarbashi, and Stelian Coros, "RL + Model-based Control: Using On-demand Optimal Control to Learn Versatile Legged Locomotion," in *IEEE Robotics and Automation Letters (RA-L)*, Oct 2023.

CONFERENCES

- [1] Adrian Hartmann, Dongho Kang, Fatemeh Zargarbashi, Miguel Angel Zamora Mora, and Stelian Coros, "Deep Compliant Control for Legged Robots," in *International Conference on Robotics and Automation (ICRA)*, May 2024. (accepted)

- [2] Daniel Widmer, Dongho Kang (equal contribution), Bhavya Sukhija, Jonas Hübotter, Andreas Krause, and Stelian Coros, “Tuning Legged Locomotion Controllers via Safe Bayesian Optimization,” in *Conference on Robot Learning (CoRL)*, Nov 2023.
- [3] 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.
- [4] 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.
- [5] 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.
- [6] 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*, 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

- Autonomous & Intelligent Robotics Lab, JNU, Gwangju, South Korea Jan 2024
- Biomimetic Robotics Lab, MIT, Cambridge, United States Nov 2023
- Interactive and Networked Robotics Lab, Seoul National University, Seoul, South Korea Dec 2022
- 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

- 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.
- Development Fund Scholarship, Seoul National University Feb 2010
Full-tuition scholarship for one academic year for outstanding academic performance.

TEACHING EXPERIENCE

ETH Zürich, Zurich, Switzerland

- Teaching Assistant, Computer Science (M. Fischer, F. Friedrich Wicker) Autumn 2023
- Teaching Assistant, Digital Humans (S. Coros, Siyu Tang) Spring 2023
- Teaching Assistant, Linear Algebra (Ö. Imamoglu, O. Sorkine-Hornung) Autumn 2022
- Teaching Assistant, Computational Models of Motion (S. Coros, B. Thomaszewski) 2021 – 2022
- Teaching Assistant, Visual Computing (S. Coros, M. Pollefeys) 2020 – 2021

Seoul National University, Seoul, South Korea

- Mentor, SNU Samsung Convergence Software Course Program 2015
- Teaching Assistant, MAE 446.204A: Dynamics 2014
- Teaching Assistant, PA 034.013: Basic Physics 2 Autumn 2011

LANGUAGES

- Korean: Native language.
- English: Fluent.

**TECHNICAL
SKILLS**

Programming and Software

C/C++, C#, Python, Matlab/Octave, Unix/Linux, Tensorflow, Pytorch, ROS, Open Dynamics Engine, Unity

Experience with Robots

UnitreeRobotics Aliengo, A1, Go1, ANYbotics ANYmal

SERVICES

Reviewer

IROS, ICRA, RA-L, Eurographics

REFERENCES

▪ **Prof. Dr. Stelian Coros**

Associate Professor in the Department of Computer Science
ETH Zürich
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▪ **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

▪ **Prof. Dr. Jemin Hwangbo**

Assistant Professor in the Department of Mechanical Engineering
Korea Advanced Institute of Science and Technology
291 Daehak-Ro, Yuseong-Gu, Daejeon, 34141, South Korea
jhwangbo@kaist.ac.kr

▪ **Prof. Dr. Dongjun Lee**

Professor in the Department of Mechanical Engineering
Seoul National University
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