

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] 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.

- [2] 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.
- [3] 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.
- [4] 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.
- [5] 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	<ul style="list-style-type: none"> ▪ Biomimetic Robotics Lab., MIT, Cambridge, United States ▪ Interactive and Networked Robotics Lab., Seoul National University, Seoul, South Korea ▪ Robot Intelligence Lab, Korea University, Seoul, South Korea ▪ NAVER LABS Corp., Seoul, South Korea ▪ Max Planck ETH Center for Learning Systems Symposium, Tübingen, Germany 	<p>Nov 2023</p> <p>Dec 2022</p> <p>Apr 2021</p> <p>Dec 2019</p> <p>Feb 2019</p>
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AWARDS & SCHOLARSHIPS	<ul style="list-style-type: none"> ▪ Birkigt Scholarship, ETH Zürich Stipendiary scholarship for international master student. ▪ Eminence Scholarship, Seoul National University Full-tuition scholarship for one academic semester for outstanding academic performance. ▪ Development Fund Scholarship, Seoul National University Full-tuition scholarship for one academic year for outstanding academic performance. 	<p>Feb 2018</p> <p>Aug 2014</p> <p>Feb 2010</p>
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TEACHING EXPERIENCE	<p>ETH Zürich, Zurich, Switzerland</p> <ul style="list-style-type: none"> ▪ Teaching Assistant, Computer Science (R. Sasse, F. Friedrich Wicker) ▪ Teaching Assistant, Digital Humans (S. Coros, Siyu Tang) ▪ Teaching Assistant, Linear Algebra (Ö. Imamoglu, O. Sorkine-Hornung) ▪ Teaching Assistant, Computational Models of Motion (S. Coros, B. Thomaszewski) ▪ Teaching Assistant, Visual Computing (S. Coros, M. Pollefeys) <p>Seoul National University, Seoul, South Korea</p> <ul style="list-style-type: none"> ▪ Mentor, SNU Samsung Convergence Software Course Program ▪ Teaching Assistant, MAE 446.204A: Dynamics ▪ Teaching Assistant, PA 034.013: Basic Physics 2 	<p>Autumn 2023</p> <p>Spring 2023</p> <p>Autumn 2022</p> <p>2021 – 2022</p> <p>2020 – 2022</p> <p>2015</p> <p>2014</p> <p>Autumn 2011</p>
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LANGUAGES	<ul style="list-style-type: none"> ▪ Korean: Native language. ▪ English: Fluent.
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TECHNICAL SKILLS	<p>Programming and Software</p> <p>C/C++, C#, Python, Matlab/Octave, Unix/Linux, Tensorflow, Pytorch, ROS, Open Dynamics Engine, Unity</p> <p>Experience with Robots</p> <p>UnitreeRobotics Aliengo, A1, Go1, ANYbotics ANYmal</p>
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SERVICES

Reviewer

IROS, ICRA, RA-L, Eurographics

REFERENCES

- **Prof. Dr. Stelian Coros**
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- **Prof. Dr. Marco Hutter**
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ETH Zürich
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- **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, South Korea
jhwangbo@kaist.ac.kr
- **Prof. Dr. Dongjun Lee**
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