Dongho Kang

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RESEARCH INTERESTS

My research aims to create a legged robot that can perform natural, 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
  - Advisor: Prof. Dr. Stelian Coros
- M.Sc. ETH in Mechanical Engineering — Sep 2016 – Aug 2019
  - Advisor: Prof. Dr. Marco Hutter
  - Graduated with distiction

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

- 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.
- 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

ETH Zürich, Zurich, Switzerland

- Teaching Assistant, Computational Models of Motion (Spring) — 2021 – 2022
- Teaching Assistant, Visual Computing (Autumn) — 2020 – 2022

Seoul National University, Seoul, South Korea

- 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

- 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,

REFERENCES

- **Prof. Dr. Stelian Coros**
  Associate Professor in the Department of Computer Science
  ETH Zürich
  Stampfenbachstrasse 48 (Sumatrastrasse 11), 8092, Zurich, Switzerland
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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
  jhwangbo@kaist.ac.kr
- **Prof. Dr. Dongjun Lee**
  Professor in the Department of Mechanical Engineering
  Seoul National University
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