Moses C. **Nah**

Robotics, Control Theory, and Motor Neuroscience

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Mount Everest stands to be the highest since its with the Himalayas.

Education

Massachusetts Institute of Technology (MIT)
Cambridge, MA, USA

Ph.D. in Mechanical Engineering — *May 2020 – Dec. 2024*

- Advisor: Prof. Neville Hogan
- Thesis: *Modular Robot Control with Motor Primitives* (Defense: Oct. 29, 2024)
- Committee: Prof. Jean-Jacques Slotine, Prof. Alberto Rodriguez
- Major: System Dynamics and Control
- Minor: Information Theory and Machine Learning

Massachusetts Institute of Technology (MIT)
Cambridge, MA, USA

M.S. in Mechanical Engineering — *Sept. 2018 – May 2020*

- Advisor: Prof. Neville Hogan
- Thesis: *Dynamic Primitives Facilitate Manipulating a Whip*
- Qualifying Exam Subjects: Dynamics, Control, Stochastic Systems

Seoul National University (SNU)
Seoul, South Korea

B.S. in Mechanical and Aerospace Engineering — *Mar. 2011 – Sept. 2018*

- Summa Cum Laude
- Leave of Absence for Military Service (2 years)

Gyeonggibuk Science High School
Gyeonggi-do, South Korea

Early Graduation with Honors — *Mar. 2009 – Mar. 2011*

- Gold Medal, 12th Korean Physics Olympiad (KPhO) **[HA13]**
- Qualifier, International Physics Olympiad (IPhO) Winter and Summer Schools
- First Place in the Placement Examination **[HA14]**

Professional & Research Experience

Holiday Robotics Research Inc.
Mountain View, CA, USA

U.S. Office Lead, Senior Research Scientist — *Feb. 2026 – Present*

- Leading the U.S. Operations & Research office of Holiday Robotics
- Geometric kinodynamic system identification of mobile-based humanoid robots for quality control

Honda Research Institute USA
San Jose, CA, USA

Postdoctoral Research Scientist: Robotics and Control Systems — *Aug. 2025 – Jan. 2026*

- Division: Intelligent Robotics Research (IRR)
- Developing intelligent, self-improving control algorithms for contact-rich manipulation tasks

Massachusetts Institute of Technology (MIT)
Cambridge, MA, USA

Postdoctoral Associate — *Jan. 2025 – July 2025*

- Supervisor: Prof. Neville Hogan
- Teaching Assistant: 2.152 Nonlinear Control (Prof. Jean-Jacques Slotine) **[T01]**
- UROP Research Advisor. Project: Human Motor Control of Spatial Orientation

SNU Biorobotics Lab
Seoul, S.Korea

Undergraduate Researcher (Bachelor's Thesis) — *Mar. 2017 – Feb. 2018*

- Supervisor: Prof. Kyu-Jin Cho
- Project 1: Stabilization of the Underactuation Mechanism of the SNU Exo-Glove Poly
- Project 2: Development of Circuitry for Material Stiffness Identification Using Force-Sensitive Resistors (FSR)

NAVER LABS Robotics Team
Gyeonggi-do, S.Korea

Robotics Research Intern — *Aug. 2016 – Feb. 2017*

- Supervisor: Dr. Sang-ok Seok
- Project: Development of a Wheel-Based Stair-Climbing Robot [C07]

Publications

Journal

[J01] Johannes Lachner, **Moses C. Nah**, Neville Hogan. *A Physically Consistent Stiffness Formulation for Contact-Rich Manipulation.* The International Journal of Robotics Research (IJRR). 2025

[J02] **Moses C. Nah**, Johannes Lachner, Neville Hogan. *Robot Control Based on Motor Primitives: A Comparison of Two Approaches.* The International Journal of Robotics Research (IJRR). 2024

[J03] **Moses C. Nah**, Aleksei Krotov, Marta Russo, Dagmar Sternad, Neville Hogan. *Learning to Manipulate a Whip with Simple Primitive Actions: A Simulation Study.* iScience. 2023

[J04] Aleksei Krotov, Marta Russo, **Moses C. Nah**, Neville Hogan, Dagmar Sternad. *Motor Control Beyond Reach: How Humans Hit a Target with a Whip.* Royal Society Open Science. 2022

Conference

[C01] **Moses C. Nah**, Johannes Lachner, Federico Tessari, Neville Hogan. *On the Modularity of Elementary Dynamic Actions.* International Conference on Intelligent Robots and Systems (IROS). 2024. **Best Conference Paper Award [HA01]**

[C02] Johannes Lachner*, **Moses C. Nah***, Stefano Stramigioli, Neville Hogan. *Exp[licit]: An Educational Robot Modeling Software Based on Exponential Maps.* International Conference on Advanced Intelligent Mechatronics (AIM). 2024. ***Equal Contribution**. `https://github.com/explicit-robotics`

[C03] **Moses C. Nah**, Aleksei Krotov, Marta Russo, Dagmar Sternad, Neville Hogan. *Manipulating a Whip in 3D via Dynamic Primitives.* International Conference on Intelligent Robots and Systems (IROS). 2021

[C04] Xiaofeng Xiong, **Moses C. Nah**, Aleksei Krotov, Dagmar Sternad. *Online Impedance Adaptation Facilitates Manipulating a Whip.* International Conference on Intelligent Robots and Systems (IROS). 2021

[C05] **Moses C. Nah**, Aleksei Krotov, Marta Russo, Dagmar Sternad, Neville Hogan. *Dynamic Primitives Facilitate Manipulating a Whip.* International Conference on Biomedical Robotics and Biomechatronics (BIOROB). 2020. **Best Student Paper Award [HA04]**

[C06] Dongil Choi, Minsu Kim, Hyeongkeun Kim, Choe Jonghun, **Moses C. Nah**. *Motion Planning of Autonomous Personal Transporter Using Model Predictive Control for Minimizing Non-Minimum Phase Behavior.* International Conference on Ubiquitous Robots (UR). 2018

[C07] Jonghun Choe*, Ukjin Kwon*, **Moses C. Nah***, Hyeongkeun Kim*. *Design Analysis of Tuskbot: Universal Stair-Climbing 4-Wheel Indoor Robot.* International Conference on Intelligent Robots and Systems (IROS). 2017. ***Equal Contribution**.

ArXiv

[ArX01] **Moses C. Nah**, Johannes Lachner, Neville Hogan. *Modular Robot Control with Motor Primitives.* 2025

[ArX02] **Moses C. Nah**, Johannes Lachner, Neville Hogan, Jean-Jacques Slotine. *Combining Movement Primitives with Contraction Theory.* 2025

[ArX03] Johannes Lachner, Federico Tessari, A. Michael West Jr., **Moses C. Nah**, Neville Hogan. *Divide et Impera: Decoding Impedance Strategies for Robotic Peg-in-Hole Assembly.* 2024

Honors & Awards

2024 **[HA01] Best Conference Paper Award**, IEEE/RSJ IROS ($2,000)
2024 **[HA02] Sontheimer Travel Award**, Massachusetts Institute of Technology ($1,500)
2023 **[HA03] MathWorks Fellowship**, Massachusetts Institute of Technology
2020 **[HA04] Best Student Paper Award**, IEEE BIOROB
2020 **[HA05] Presentation Award (First Place)**, MIT MERE ($500)
2018 **[HA06] Startup Investment Award**, SNU Startup Camp (₩1,500,000)
2017 **[HA07] Excellence Award**, SNU Smart Social Contribution Contest (₩1,500,000)
2017 **[HA08] Excellent Paper Award**, SNU CTL 26th Best Report Contest (₩500,000)
2017 **[HA09] Young Talent Support Fellowship**, NAVER LABS
2017 **[HA10] Gwanak Fellowship**, Hanil Corporation
2013 **[HA11] Grand Prize**, SNU Design, Manufacturing Process, and Laboratory Contest
2011 **[HA12] First Runner-Up**, SNU Creative Engineering and Design Contest
2009 **[HA13] Gold Medalist**, 12th Korea Physics Olympiad (KPhO), High School Division
2009 **[HA14] First Place (Top Admitted Student)**, Gyeonggibuk Science High School Placement Examination
2008 **[HA15] Silver Medalist**, 11th Korea Physics Olympiad (KPhO), Middle School Division

Teaching Experience

Teaching Assistant (MIT)

Spring 2025 **[T01] 2.152 Nonlinear Control**, Prof. Jean-Jacques Slotine (Rating: 7.0/7.0, Median)
Fall 2024 **[T02] 2.151 Advanced System Dynamics and Control**, Prof. Neville Hogan (Rating: 6.9/7.0)
Fall 2022 **[T03] 2.032 Dynamics**, Prof. Triantaphyllos Akylas (Rating: 6.8/7.0)
Fall 2021 **[T04] 2.151 Advanced System Dynamics and Control**, Prof. Neville Hogan (Rating: 6.8/7.0)

Undergraduate Research Mentor (MIT)

Jan. 2025–Present **[T05] Bronwyn Busby**, Human Control of Spatial Orientation
Sept. 2022–June 2023 **[T06] Yinkai Dong**, Impedance Parameter Estimation via Adaptive Sliding Mode Control

Presentations and Invited Talks

Conference Presentations

2023 **[P01] IROS**, Workshop on Leveraging Models for Contact-Rich Manipulation (*OpenReview*)
2020 **[P02] Neural Control of Movement (NCM)**, Blitz Talk (*Program*)
2020 **[P03] Neuromatch Conference 3.0**, *Watch Video*

Poster Presentations

2025 **[P04] Harvard NSF Workshop on Reinforcement Learning**
2021 **[P05] Robotics: Science and Systems (RSS)**, Workshop on Deformable Object Simulation (DO-Sim)
2020 **[P06] IROS**, Workshop on Impedance Learning (*Website* / *Abstract*)
2019 **[P07] MIT Embodied Intelligence Research Mixer**

Invited Talks

2025 **[P08] North Carolina State University**, Topic: Modular Robot Control with Motor Primitives
2022 **[P09] KUKA Robotics**, Topic: Robot Control Based on Motor Primitives (Virtual)
2017 **[P10] TEDxSNU**, Featured Speaker, Session: *People Who Make Something*

Academic Service

Reviewer: Conferences IROS (2021, 2024, 2025), ICRA (2022, 2024, 2025), BIOROB (2024), ISRR (2024)
Reviewer: Journals T-RO (2024), RA-L (2024)

Skills

Robotics & Mechatronics KUKA LBR iiwa, Franka Emika Panda, Allegro Hand, ROS 1/2, LabVIEW, KiCAD, SolidWorks
Simulation & Modeling MuJoCo, MATLAB
Programming & Tools C/C++, Java, Python, Docker, Bash, Git, LaTeX
Mathematics (Selected Topics) Nonlinear Control Theory, Differential Geometry, Rigid Body Kinematics and Dynamics
Languages Korean (Native), English (Full Professional Proficiency), Japanese (Elementary)