

NICK ROTELLA

nicholas.rotella@gmail.com ♦ nrotella.github.io

EDUCATION

Ph.D. in Computer Science, University of Southern California

May 2014 - May 2018

Thesis: “[Estimation-Based Control for Humanoid Robots](#)”

Los Angeles, CA

Advisors: Prof. Stefan Schaal and Prof. Ludovic Righetti

M.S. in Computer Science, University of Southern California

Aug 2012 - May 2014

Specialization: Intelligent Robotics

Los Angeles, CA

B.S. in Mechanical Engineering, The Cooper Union

Aug 2008 - June 2012

Thesis: “[Gestural Language for Operations in Virtual Environments](#)”

New York, NY

EXPERIENCE

Seegrid

Jan 2021 - Present

Research Software Engineer

Pittsburgh, PA (Remote)

- Founding team member of [Blue Labs](#) R&D group; exploration of aspirational technologies for AMRs
- Past projects include high-fidelity simulation, model predictive control, deep learning-based perception, and advanced stereo vision

Ainstein

Kansas City, MO

Independent Contractor/Consultant

Jan 2021 - Present

- ROS package development for radar-based perception
- Support definition of long-term strategic objectives in robotics space

Senior Robotics Software Engineer

Sept 2018 - Jan 2021

- Developed sensor fusion, multi-object tracking, mapping, and motion control software for self-driving vehicles, AMRs, and drones using LIDAR, radar, vision, GPS, and IMU
- Utilized NVIDIA Jetson, NVIDIA Drive, and Xilinx SoC embedded computing platforms
- Developed and maintained [ROS packages](#) for sensor integration and radar-based 3d perception

Garmin

Jan 2018 - Sept 2018

Controls Software Engineer

Kansas City, MO

- Developed optimal controllers and adaptive estimators for underactuated marine systems
- Tuned and validated algorithms in a custom physics simulator and on real systems

Max Planck Institute for Intelligent Systems

Mar 2017 - Aug 2017

Freelance Robotist

Tuebingen, Germany

- Developed a walking control system for bipedal locomotion
- Implemented and tuned low-level torque control firmware for humanoid robots

SUNY Downstate Medical School

June 2011 - Dec 2011

Research Intern (Advisor: Dr. Joe Francis)

Brooklyn, NY

- Simulated a population of motor cortex neurons in a center-out reaching task
- Implemented a simulated brain-machine interface using a neural network trained by reinforcement learning, analyzed performance, and published results

University of Iceland

June 2010 - July 2010

Exchange Researcher (Advisor: Prof. Robert Dell)

Reykjavik, Iceland

- Designed and constructed a geothermally-heated garden, performed data analysis of plant growth

SKILLS

Programming Languages	C, C++, Python, MATLAB, \LaTeX
Software/Libraries	ROS/ROS 2, Gazebo, Eigen, OpenCV, PCL, TensorFlow, PyTorch
Tools/OSs	Linux, Xenomai, Git, Docker, Atlassian, JetBrains
Certifications	Deep Learning Specialization (Coursera, 2021-2022) Generative Adversarial Networks (GANs) Specialization (Coursera, 2022) DeepLearning.AI TensorFlow Developer Certification (Coursera, 2022)

CONFERENCES AND PUBLICATIONS

S. Khorshidi, A. Gazar, **N. Rotella**, M. Naveau, L. Righetti, and M. Khadiv. “On the Use of Torque Measurement in Centroidal State Estimation”. In: *2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. 2022 (in review).

S. Mason, **N. Rotella**, S. Schaal, and L. Righetti. “MPC Walking Framework With External Contact Forces”. In: *2018 IEEE International Conference on Robotics and Automation (ICRA)*. 2018.

N. Rotella, S. Schaal, and L. Righetti. “Unsupervised Contact Learning for Humanoid Estimation and Control”. In: *2018 IEEE International Conference on Robotics and Automation (ICRA)*. 2018.

S. Mason, **N. Rotella**, S. Schaal, and L. Righetti. “Balancing and walking using full dynamics LQR control with contact constraints”. In: *2016 IEEE-RAS 16th International Conference on Humanoid Robots (Humanoids)*. Nov. 2016.

N. Rotella, S. Mason, L. Righetti, and S. Schaal. “IMU-based joint state estimation for humanoid control”. In: *Proceedings of Dynamic Walking 2016*. June 2016.

N. Rotella, S. Mason, S. Schaal, and L. Righetti. “Inertial sensor-based humanoid joint state estimation”. In: *2016 IEEE International Conference on Robotics and Automation (ICRA)*. May 2016.

A. Herzog, **N. Rotella**, S. Schaal, and L. Righetti. “Trajectory generation for multi-contact momentum control”. In: *Humanoid Robots (Humanoids), 2015 IEEE-RAS 15th International Conference on*. Nov. 2015.

A. Herzog, **N. Rotella**, S. Mason, F. Grimmering, S. Schaal, and L. Righetti. “Momentum control with hierarchical inverse dynamics on a torque-controlled humanoid”. In: *Autonomous Robots* (2015).

N. Rotella, A. Herzog, L. Righetti, and S. Schaal. “Momentum Estimation, Planning and Control for Force-Centric Bipedal Locomotion”. In: *Proceedings of Dynamic Walking 2015*. July 2015.

N. Rotella, A. Herzog, S. Schaal, and L. Righetti. “Humanoid momentum estimation using sensed contact wrenches”. In: *Humanoid Robots (Humanoids), 2015 IEEE-RAS 15th International Conference on*. Nov. 2015.

N. Rotella, M. Bloesch, L. Righetti, and S. Schaal. “State estimation for a humanoid robot”. In: *2014 IEEE/RSJ International Conference on Intelligent Robots and Systems*. Sept. 2014.

N. Rotella, M. Bloesch, L. Righetti, and S. Schaal. “State Estimation for Walking Humanoids on Unknown Terrain”. In: *Proceedings of Dynamic Walking 2014*. June 2014.

A. Tarigoppula, **N. Rotella**, and J. T. Francis. “Properties of a temporal difference reinforcement learning brain machine interface driven by a simulated motor cortex”. In: *2012 Annual International Conference of the IEEE Engineering in Medicine and Biology Society*. Aug. 2012.

TEACHING, MENTORSHIP, AND SERVICE

- Regular reviewer for conference (IROS, ICRA, Humanoids, CoRL, MFI, AIM, BioRob) and journal (RA-L, TR-O, AURO, JINT, RAS, Sensors, Electronics) publications 2012 - Present
- Programming Mentor, FIRST Robotics Team 1939 Nov 2019 - Present
- TA, Intro to Neurophysiology, The Cooper Union Aug 2011 - Dec 2011
- TA, Summer Engineering Research Program, The Cooper Union June 2011 - Aug 2011