NICK ROTELLA

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EDUCATION

Ph.D. in Computer Science , University of Southern California Thesis: "Estimation-Based Control for Humanoid Robots" Advisors: Prof. Stefan Schaal and Prof. Ludovic Righetti	May 2014 - May 2018 Los Angeles, CA
M.S. in Computer Science , University of Southern California Specialization: Intelligent Robotics	Aug 2012 - May 2014 Los Angeles, CA
B.S. in Mechanical Engineering , The Cooper Union Thesis: "Gestural Language for Operations in Virtual Environments"	Aug 2008 - June 2012 New York, NY
EXPERIENCE	
Agility Robotics Senior Software Engineer	Sept 2022 - Present Tangent, OR (Remote)
• State estimation and controls software development for humanoid robots	
Seegrid Research Software Engineer	Jan 2021 - Sept 2022 Pittsburgh, PA (Remote)
 Founding team member of Blue Labs R&D group; exploration of aspirational tech Projects included high-fidelity simulation, deep learning-based perception, and additional technologies. 	hnologies for AMRs lvanced stereo vision
Ainstein Independent Contractor/Consultant	Kansas City, MO Jan 2021 - Sept 2022
ROS package development for radar-based perceptionSupported definition of long-term strategic objectives in robotics space	
Senior Robotics Software Engineer	Sept 2018 - Jan 2021
Software development for autonomous systems with LIDAR, radar, vision, GPS,Utilized NVIDIA Jetson, NVIDIA Drive, and Xilinx SoC embedded computing p	and IMU latforms
Garmin Controls Software Engineer	Jan 2018 - Sept 2018 Kansas City, MO
Developed optimal controllers and adaptive estimators for underactuated marineTuned and validated algorithms in a custom physics simulator and on real system	systems
Max Planck Institute for Intelligent Systems Freelance Roboticist	Mar 2017 - Aug 2017 Tuebingen, Germany
Developed a walking control system for bipedal locomotionImplemented and tuned low-level torque control firmware for humanoid robots	
SUNY Downstate Medical School Research Intern (Advisor: Dr. Joe Francis)	June 2011 - Dec 2011 Brooklyn, NY
• Implemented a simulated brain-machine interface using a neural network trained	by reinforcement learning
University of Iceland Exchange Researcher (Advisor: Prof. Robert Dell)	June 2010 - July 2010 Reykjavik, Iceland

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

Programming Languages	C, C++, Python, MATLAB, IAT_EX	
Software/Libraries	ROS/ROS 2, Gazebo, Eigen, OpenCV, PCL, TensorFlow, PyTorch	
$\operatorname{Tools}/\operatorname{OSs}$	Linux, Xenomai, Git, Docker, Atlassian, JetBrains	
Certifications	ificationsDeep Learning Specialization (Coursera, 2021-2022)Generative Adversarial Networks (GANs) Specialization (Coursera, 20	
	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: 2023 IEEE International Conference on Robotics and Automation (ICRA). 2023 (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. Grimminger, 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) 2012 - Present
and journal (RA-L, TR-O, AURO, JINT, RAS, Sensors, Electronics) publications	
• Programming Mentor, FIRST Robotics Team 1939	2019 - 2021

• TA, Intro to Neurophysiology, The Cooper Union

2019 - 2021

Aug 2011 - Dec 2011

• TA, Summer Engineering Research Program, The Cooper Union

June 2011 - Aug 2011