

Daniel Nakhimovich

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EDUCATION



Rutgers University

Doctor of Philosophy in Robotics; GPA: 3.94

New Brunswick, NJ

Sept 2019 – May 2025



The Cooper Union

Bachelor of Engineering in Electrical Engineering; GPA: 3.55

New York, NY

Sept 2015 – May 2019



Machon Shlomo: The Heiden Institute

Jewish Law, Ethics, Philosophy, and Leadership

Jerusalem, Israel

Sept 2021 – June 2023

INDUSTRY EXPERIENCE



PulsePoint

TechOps Intern

New York, NY

Summer 2017

- **QPS Monitoring:** QPS stands for queries per second. Optimized application metric collection/alerting to reduce the false positive rate of QPS drops.
- **System Integrity:** Automated the backup and data verification of large (~100GB) databases.



Concepthea

Mobile Application Developer

Fair Lawn, NJ

2015 – 2016

- **Blood-loss:** A mobile application on Android/iOS for doctors that calculates the maximum allowable blood-loss that a patient can undergo before reaching critical condition
- **JAM Fractals:** A mobile game on Android OS that allows a player to mix ingredients to form seemingly random and chaotic fractal images
- **Sepsis Clock:** An iOS application to help doctors keep track of the time and completion progress of the procedures to treat patients with septic shock

TEACHING/MENTOR EXPERIENCE



Lumiere Education

Research Mentor

Online

Summer 2023



Rutgers University

New Brunswick, NJ

- **2020 – 2021; Mentor:** Mentored undergraduate students in robotics projects.
- **2019; Teaching Assistant:** 512: Introduction to Data Structures and Algorithms



Concepthea

Mentor to Android Development Interns

Fair Lawn, NJ

2015 – 2016



Fair Lawn High School

Marching Band Woodwind Section Leader and Clarinet Tutor

Fair Lawn, NJ

2014 – 2015

SKILLS

Languages: C/C++/Objective-C, Python, Rust, Java, C#, MATLAB, Verilog, Bash, HTML/CSS, Russian

Robotics and Sensing Software: OpenCV, CGAL, ROS, Gazebo

Robots and Hardware: Baxter, Yaskawa Motoman, Xilinx FPGAs, 3D Printers

Physics Engines: Bullet, Godot, Unity

Miscellaneous: Docker, Boost

AWARDS/CERTIFICATIONS

2023; Best Design Process Award at HRI: Development of a Socially Cognizant Robotic Campus Guide
2023; Certificate in Socially Cognizant Robotics: Upon completing 2 years in an NSF-funded National Research Traineeship focused on Socially Cognizant Robotics for a Technology Enhanced Society
2021; Best Paper Award at BigVis: Graph Cities: Their Buildings, Waves, and Fragments
2018; HackCooper; 1st prize: skEye Net - Wireless eye tracking / gaze estimation headset that works in realtime
2015 — 2019; Half-tuition scholarship: Merit scholarship from Cooper Union
2015 — 2019; Innovators Merit Scholarship: Merit scholarship from Cooper Union
2015; David Lee Memorial Scholarship: For academic achievement and community service

ONE-OFF PROJECTS

2019; OpenSesame: Open source cryptographic co-processor implemented on an FPGA
2018; pass2act: Passive to active sentence transformer built using spaCy's dependency tree parser
2017; biboch: Bitboard checkers implementation with an AI that performs a fast alpha/beta search on the game tree
2016; 8-bit processor: Custom 8-bit instruction set architecture written in verilog
2015; 2048 Circuit: A recreation of the popular mobile game 2048 using various CMOS ICs, buttons, and LEDs

PEER-REVIEWED PUBLICATIONS

Development of a Socially Cognizant Robotic Campus Guide, by Benjamin Greenberg, Daniel Nakhimovich, Richard Magnotti, Hriday Purohit, Sanskar Shah, Aniket Satish Kulkarni, Uriel Gonzalez-Bravo, and Noah R. Carver, in *Companion of the 2024 ACM/IEEE International Conference on Human-Robot Interaction (HRI)*, 2024.

Resolution Complete In-Place Object Retrieval given Known Object Models, by Daniel Nakhimovich, Yinglong Miao, and Kostas E. Bekris, in *IEEE International Conference on Robotics and Automation (ICRA)*, 2023.

Persistent Homology for Effective Non-Prehensile Manipulation, by Ewerton R. Vieira, Daniel Nakhimovich, Kai Gao, Rui Wang, Jingjin Yu, and Kostas E. Bekris, in *IEEE International Conference on Robotics and Automation (ICRA)*, 2022.

Uniform Object Rearrangement: From Complete Monotone Primitives to Efficient Non-Monotone Informed Search, by Rui Wang, Kai Gao, Daniel Nakhimovich, Jingjin Yu, and Kostas E. Bekris, in *IEEE International Conference on Robotics and Automation (ICRA)*, 2021.

Robotics as an Enabler of Resiliency to Disasters: Promises and Pitfalls, by Rui Wang, Daniel Nakhimovich, Fred S. Roberts, and Kostas E. Bekris, in *Resilience in the Digital Age - Lecture Notes in Computer Science (LNCS)*, Springer Nature, 2021.

Pushing the Boundaries of Asymptotic Optimality in Integrated Task and Motion Planning, by Rahul Shome, Daniel Nakhimovich, and Kostas E. Bekris, in *Algorithmic Foundations of Robotics XIV*, Springer International Publishing, 2021.

Giga Graph Cities: Their Buckets, Buildings, Waves, and Fragments, by James Abello, Haoyang Zhang, Daniel Nakhimovich, Chengguizi Han, and Mridul Aanjaneya, in *IEEE Computer Graphics and Applications*, IEEE, 2022.

Graph Cities: Their Buildings, Waves, and Fragments, by James Abello, Daniel Nakhimovich, Chengguizi Han, and Mridul Aanjaneya, in *The 4th International Workshop on Big Data Visual Exploration and Analytics with EDBT/ICDT (BigVis)*, 2021.

Graph Waves, by James Abello and Daniel Nakhimovich, in *The 3rd International Workshop on Big Data Visual Exploration and Analytics with EDBT/ICDT (BigVis)*, 2020.

ADDITIONAL RESEARCH PROJECTS



PRACSYS

PI: Kostas Bekris

New Brunswick, NJ

Sept 2019 – May 2025

- **Robot Nudging:** A robot nudge is a robot behaviour or inherent design which alters a person's behaviour without significantly changing the incentive structure. I performed an extensive literature review of the subject in order to discover which ethical parameters are most urgent to consider for robot designers and policy makers.
- **Object Rotation Task Descriptions for Robots in English:** I performed an informal survey, collecting human descriptions in English of household objects being rotated in a simulated environment. The goal is to study how people naturally describe tasks to a robot without assumptions of "key words" and "wake phrases".
- **Put That There:** Human-Robot Interaction studies typically focus on robots understanding humans whereas this project studies how robots can be better understood by humans. I designed and performed experiments to test human ability to interpret instructions given by a real robot.



DIMACS

PI: James Abello

Piscataway, NJ

Summer 2018 – 2020

- **k-connectivity:** k-connectivity is a connectivity measure for graphs. I designed two algorithms for finding approximations of minimum separating sets of a graph in order to perform efficient graph decomposition for data visualization.
- **Graph Peeling:** Graph Peeling is the iterative process of removing vertices from a graph. I explored properties of various graph peeling techniques and designed a new peeling algorithm (wave decomposition) in order to decompose very large graphs efficiently.

MISCELLANEOUS

Peer Reviews: 2019 - ...

- **ISER:** International Symposium on Experimental Robotics
- **IROS:** Conference on Intelligent Robots and Systems
- **RSS:** Robotics: Science and Systems Conference
- **CoRL:** Conference on Robot Learning
- **ICRA:** International Conference on Robotics and Automation
- **ICAR:** International Conference on Advanced Robotics
- **RA-L:** IEEE Robotics and Automation Letters
- **BigVis:** Big Data Visual Exploration and Analytics Conference