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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*

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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.

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ADDITIONAL RESEARCH PROJECTS



**PRACSYS**

*PI: Kostas Bekris*

New Brunswick, NJ

*Sept 2019 – ...*

- **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.

## ONE-OFF PROJECTS

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**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

## TEACHING/MENTOR EXPERIENCE

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**Teaching Assistant; Rutgers University:**

- **2019:** 512: Introduction to Data Structures and Algorithms

**2015 — 2016; Conceptheca:** Mentored Android development intern

**2014 — 2015; Fair Lawn High School:** Marching Band Woodwind Section Leader; Clarinet Tutor

## INDUSTRY EXPERIENCE

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### 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.

### Conceptheca

*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

## SKILLS

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**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, Xilinx FPGAs, 3D Printing

**Physics Engines:** Bullet, Godot, Unity

**Miscellaneous:** Docker

## AWARDS

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**2021; Best Paper Award at BigVis:** Graph Cities: Their Buildings, Waves, and Fragments

**2018; HackCooper; 1<sup>st</sup> 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

### Peer Reviews: 2019 - ...

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