Contact:	nilles2@illinois.edu
	http://nilles2.web.engr.illinois.edu/
Status:	PhD Candidate
	Computer Science Department, University of Illinois at Urbana-Champaign
	Advisor: Steve LaValle
Research Interests:	Dynamics, control and design of mobile robots, with an emphasis on characterizing tasks and their minimal sensing, power and computational requirements, and using physical compliance to increase robustness of underactuated robots.

EDUCATION

University of Illinois (UIUC) (Urbana-Champaign, IL)

Degree:	PhD in Computer Science
Dates:	Aug 2015 - present
GPA:	3.73

Colorado School of Mines (CSM) (Golden, CO)

Degree:	B.S. in Engineering Physics
	Minor in Computational and Applied Mathematics
	Minor in Public Affairs, from McBride Honors Program
Dates:	August 2011 to May 2015
GPA:	3.93

SKILLS

Programming:	Skilled in Haskell, Python, C++, embedded programming (mBed, Arduino), MatLab, Mathematica, parallel computing, shell scripting. Comfortable learning new languages.
Experimental:	Electronics prototype design and construction, using electronics lab equipment (oscilloscopes, multimeters, soldering, etc), safety and troubleshooting techniques. Experienced with collection and analysis of video, motion-capture, and IMU data.
Computing:	Experience in Linux (several distributions, comfortable with the command line), LaTeX, Git, Pandoc, and high performance computing clusters.
Teaching:	Paid tutor at Colorado School of Mines math learning center. Volunteer tutor at Python, Linux, and high-performance computing help sessions.

PEER-REVIEWED PUBLICATIONS

- A. Q. Nilles, Y. Ren, I. Becerra, S. M. LaValle. "A Visibility-Based Approach to Computing Nondeterministic Bouncing Strategies," in the *13th Annual Workshop on the Algorithmic Foundations of Robotics*, 2018.
- A. Q. Nilles, C. Gladish, M. Beckman, and A. LaViers. "Improv: Live Coding for Robot Motion Design," in *Proceedings of the 5th International Conference on Movement Computing*, ACM. 2018.
- A. LaViers, C. Cuan, C. Maguire, K. Bradley, K. B. Mata, A. Nilles, I. Vidrin, N. Chakraborty, M. Heimerdinger, U. Huzaifa, R. McNish, I. Pakrasi, and A. Zurawski. "Choreographic and Somatic Approaches for the Development of Expressive Robotic Systems," in *MDPI – Arts*, 2018.
- A. Q. Nilles, I. Becerra, and S. M. LaValle. "Periodic Trajectories of Mobile Robots," in *IEEE Conference on Intelligent Robots and Systems (IROS)*, 2017.

MISC PUBLICATIONS, INVITED TALKS AND POSTERS

- "Towards Self-Assembly and Collective Manipulation with Extremely Underactuated Robots," NxR Group Meeting, Northwestern University. 1 March 2019.
- A. Q. Nilles, D. A. Shell, J. M. O'Kane. "Robot Design: Formalisms, Representations, and the Role of the Designer," in *Workshop on the Autonomous Design of Robots* at ICRA 2018.
- A. Q. Nilles, I. Becerra, and S. M. LaValle. "Controllable Billiards: Characterizing the Paths of Simple Mobile Robots," poster in *Dynamics Days*, 2018.
- "Interesting Trajectories of Mobile Robots in Polygons," 2017 Midwest Robotics Workshop (MWRW). May 18 2017.
- "New Developments in Combinatorial Data Structures and Algorithms for Robotic Planning, Filtering and Design," UIUC Theory Seminar, October 3 2016.
- "Case Studies in Robotics Toolchains," UIUC Robotics Seminar, September 9 2016.

- A. Q. Nilles, "Partially Coherent Transport: Computational Analysis and Overcoming Anderson Localization," 2014 CSM Physics poster session.
- A. Q. Nilles, "Teaching the Smart Grid: Why Data Management is Essential to the Future of Electricity," WISE Journal of Engineering and Public Policy.

PROFESSIONAL ACTIVITIES

- President of Computer Science Graduate Students Organization (fall 2017 - present).
  - Organize social events, communicate with department administration about graduate student needs, assist in organizing annual prospective PhD student visit weekend.
- Reviewer for IROS '17, '18, '19; ICRA '18, '19; EAAI '17
- Program Committee Member for MRS '19
- Co-organizer for 2017 Robotic Science and Systems (RSS) full day workshop, "Minimality and Trade-offs in Automated Robot Design." July 16 2017.
  - Recruited and communicated with speakers, helped develop materials (The Robot Design Game, http://robot-design.org/), facilitated workshop and discussions.
- Head of student committee organizing an internal Robotics@UIUC seminar (Fall 2016 semester).
  - Recruited student speakers, advertised talks, maintained wiki with schedule and speaker slides.

AWARDS AND HONORS

- Leung Student Venture Fund Award ($1000 to support undergraduate researchers in the Motion Strategy Lab), UIUC ECE Department. I supervised these undergraduates and wrote majority of the grant application. 2019
- Saburo Muroga Endowed Fellowship, UIUC CS Department. 2015-2016
- Physics Faculty Distinguished Graduate Award, CSM. May 2015
- Leo Borasio Outstanding Junior Award, McBride Honors Program, CSM. May 2014
- President's Undergraduate Scholarship, CSM. 2011-2015
- ECC Women's Leadership Group Scholarship. 2011

OUTREACH AND DIVERSITY SERVICE

- 2019: WAFR Robot Guru Mentor - ongoing mentorship of undergraduates.
- 2014: Founding member of Equality Through Awareness (ETA) at CSM, a group promoting diversity in STEM through discussion, mentoring, and invited speakers.
  - personally facilitated weekly group discussions on articles and topics relevant to underrepresented minorities
  - 2018: ETA was awarded the Martin Luther King Jr. Recognition Award from CSM
- 2012-2015: Society of Physics Students - participated in outreach events such as travelling to local elementary/middle schools to do science demos and promote interest in physics

PAST EMPLOYMENT

Petronics internship: Development of small, agile mobile robot

Description:	Over the summer, I worked with Petronics to develop hardware and software for their mobile platform. I helped add a wifi module to the robot which streamed data to a ROS server, which I also helped set up and configure. I wrote software for collecting and analyzing the resulting data. The goal was to compare streaming pose estimates from the robot with a ground truth from a motion capture system (also ROS-integrated), to analyze how the robot slipped on different surfaces and learn better controllers.
Dates:	May 2016 - August 2016

Complexity Sciences Center, UC Davis: Implementing Predicted Information Gain Algorithms

Description:	While working in Dr. Jim Crutchfield's group, I successfully implemented an information-theoretic learning algorithm for exploratory robots with limited sensing capabilities. I also researched ways to include more memory in the learning algorithm.
Dates:	June - Aug 2014

Colorado School of Mines Math Learning Center

Description:	Tutor five hours a week for all classes in Math department. Primarily calculus, differential equations, and linear algebra.
Dates:	Jan 2015 - May 2015

North American Network of Science Labs Online (NANSLO)

Description: Developed, monitored, and troubleshot remote-controlled robotic physics, chemistry, and biology experiments for college students in online classes. Served as a TA and equipment technician while classes were running.

Dates: Feb 2012 - May 2014

Institute of Electrical and Electronics Engineers (IEEE)

Description: Washington Internships for Students of Engineering (WISE) program: researched smart grid data management and policy alternatives; published an overview and policy recommendation in the *WISE Journal of Engineering and Public Policy.*

Dates: June - Aug 2013