

# Petras Swissler

ASSISTANT PROFESSOR · MECHANICAL ENGINEERING

New Jersey Institute of Technology, University Heights, Newark, NJ 07102

✉ petras.swissler@njit.edu | 🏠 pswiss.github.io | ORCID: 0000-0002-8528-4449

## Appointments

### New Jersey Institute of Technology

ASSISTANT PROFESSOR, MECHANICAL ENGINEERING

- **Research interests:** robotic self-assembly, multi-robot systems, mechatronics, social insect behavior

### Northwestern University

RESEARCH ASSISTANT

- Adviser: Dr. Michael Rubenstein

Newark, NJ

2022 - present

Evanston, IL

2016 - 2022

## Education

### Northwestern University

PHD MECHANICAL ENGINEERING

- Adviser: Dr. Michael Rubenstein
- Thesis: Large-scale robotic self-assembly using alignment-agnostic docking

Evanston, IL

2016 - 2022

### Northwestern University

MS MECHANICAL ENGINEERING

- Adviser: Dr. Michael Rubenstein
- Thesis: FireAnt: A modular robot with full-body continuous docks

Evanston, IL

2016 - 2018

### Rose-Hulman Institute of Technology

BS MECHANICAL ENGINEERING

- Minors Robotics, Electrical Engineering, Spanish

Terre Haute, IN

2008 - 2012

## Grants

SUBMITTED

2022 Collaborative Proposal, NSF: Foundational Research in Robotics

(requested)

\$422,567

## Awards and Notable Achievements

2022 US Patent 11,305,421: Method and system for joining robotic components, USPTO

2021 McCormick School of Engineering Terminal Year Fellowship, Northwestern University  
Best Student Paper: ReactiveBuild, DARS Conference

2016 Murphy Fellowship, Northwestern University

## Peer-Reviewed Publications

PUBLISHED

**Petras Swissler** and Michael Rubenstein. 2021. ReactiveBuild: environment-adaptive self-assembly of amorphous structures. 2021 International Symposium on Distributed Autonomous Robotic Systems (DARS).

**Winner: Best student paper**

**Petras Swisler** and Michael Rubenstein. 2020. FireAnt3D: A 3D self-climbing robot towards non-latticed robot self-assembly. 2020 IEEE International Conference on Intelligent Robots and Systems (IROS).

**Petras Swisler** and Michael Rubenstein. 2018. FireAnt: A modular robot with full-body continuous docks. 2018 IEEE International Conference on Robotics and Automation (ICRA).

## IN PREPARATION

**Petras Swisler** and Michael Rubenstein. FireAntV3: A robot capable of non-latticed and environment-adaptive self-assembly.

## Presentations

---

### INVITED TALKS

**Petras Swisler**. Spring 2022. Towards building structures using thousands of robots: Non-latticed and environment-adaptive robotic self-assembly.  
*Interview research presentations at various universities.*

**Petras Swisler**. Summer 2020. FireAnt3D: a 3D self-climbing robot towards non-latticed robotic self-assembly.  
*Invited by Chicago-area robotics and automation society.*

**Petras Swisler**. Spring 2019. Climbing over the bodies of your peers: The locomotive challenges of robotic self-assembly.  
*Invited by the Mechanical Engineering Graduate Student Society, Northwestern University, Evanston, IL.*

**Petras Swisler** June 2012. ASME HPVC best practices: team history and advice to new teams.  
*Invited by ASME Human Powered Vehicle Challenge.*

### CONTRIBUTED PRESENTATIONS

**Petras Swisler**. 2022. FireAnt v3: A non-latticed Modular robot towards environment-reactive self-assembly.  
*Modular Robotics Workshop: International Conference on Robotics and Automation, Philadelphia, PA.*

**Petras Swisler**. 2021. ReactiveBuild: environment-adaptive self-assembly of amorphous structures.  
*Virtual presentation and live Q&A: International Symposium on Distributed Autonomous Robotic Systems.*

**Petras Swisler**. 2020. FireAnt3D: a 3D self-climbing robot towards non-latticed robotic self-assembly.  
*Virtual presentation and Q&A: International Conference on Intelligent Robots and Systems.*

**Petras Swisler**. 2018. FireAnt: a modular robot with full-body continuous docks.  
*Swarm robotics workshop: International Conference on Robotics and Automation.*

## Professional Experience

---

### Northwestern University

Evanston, IL

#### TEACHING ASSISTANT

2021

- ME333: Introduction to Mechatronics

### Parametric Solutions Inc.

Jupiter, FL

#### MECHANICAL ENGINEER

2012 - 2016

- Managed team of approximately 10 engineers
- Designed jet engine components

## Service

---

### REVIEWER

- Agence Nationale de la Recherche, AAPG 2022 scientific panel Interaction, robotique
- IEEE Transactions on Robotics (T-Ro)
- International Symposium on Distributed Autonomous Robotic Systems (DARS)
- Robotics Science and Systems (RSS)

- IEEE International Conference on Intelligent Robots and Systems (IROS)
- Swarm Intelligence

## OUTREACH

2021	<b>Middle school robotics tournament at U. Chicago laboratory school</b> , Judge.	<i>Chicago, IL</i>
2020 - 2021	<b>Day in the life of a STEM-itist</b> , Presenter.	<i>Evanston, IL</i>
2016 - 2021	<b>Northwestern Splash</b> , Teacher, Treasurer, Secretary.	<i>Evanston, IL</i>
2017 - 2020	<b>Science in your community center</b> , Volunteer Mentor.	<i>Evanston, IL</i>
2019	<b>National Robotics Week</b> , Volunteer.	<i>Chicago, IL</i>