

# Danna Ma

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## EDUCATION

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### Cornell University

*Ph.D in Electrical and Computer Engineering*

Ithaca, NY

*Aug. 2018 - Present*

**Research Topics:** Modular Robots, Smart Active Matter, Soft Robots, Tactile Sensors

**Visiting Researcher:** Max Planck Institute for Intelligent Systems with Prof. Metin Sitti

**Academic Advisors:** Prof. Kirstin Hagelskjaer Petersen, Prof Nils Napp, Prof Paul McEuen

### Cornell University

*M.Eng. in Electrical and Computer Engineering*

Ithaca, NY

*Aug. 2016 – May 2018*

### National University of Singapore

*B.S. in Electrical Engineering*

Singapore

*Aug. 2012 – May 2016*

**Thesis Title:** On Surface Passivation Mechanism of P-type Aluminum Local Back Surface Field Solar Cells

**Thesis Research Institute:** Solar Energy Research Institute of Singapore

**Undergraduate Thesis Advisor:** Prof. Armin Gerhard Aberle

### Centrale Supélec

*Student Exchange Program*

Saint-Aubin, France

*Jan. 2015 – June 2015*

### Grenoble Institute of Technology

*Nano-Techonology Summer Program*

Grenoble, France

*May. 2013 – July 2013*

## PUBLICATIONS

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**Ma, D.\***, Ceron, S\*, Kaiser, G., and Petersen, K. (2020). Simple, Low-Cost Fabrication of Soft Sensors for Shape Reconstruction. *IEEE Robotics and Automation Letters*

**Ma, D.**, Chen, J., Cutler, S., Petersen, K. (2022). Smarticle 2.0: Design of Scalable, Entangled Smart Matter. *International Symposium on Distributed Autonomous Robotic Systems*

**Ma, D.**, Petersen, K., Murphey, T., and Goldman, D. I. (2023) Smarticles 2.0-Robotic Modules Designed for 3D Entanglement. Abstracts. *American Physical Society's March Meeting*

Cutler, S., **Ma, D.**, Petersen, K. (2025). Strain-Coordinated Formation, Migration, and Encapsulation Behaviors in a Tethered Robot Collective. *IEEE International Conference on Robotics and Automation*

**Ma, D.**, Vardhan, A., Chong, B. Goldman, D.I., Petersen, K. Leveraging Hybrid Dynamics for Collective Migration in Simple Robots. *Journal submission* (in progress)

\* Equal contributing authors.

## INVITED TALKS

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“Smarticle into Collective Intelligence.” International Conference on Intelligent Robots and Systems, Detroit, Michigan, USA, Oct. 2023

“Exploiting Hybrid Dynamics for Collective Locomotion in Granular Smart Matter.” GRASP Laboratory Student Faculty Industry Seminar, University of Pennsylvania, Philadelphia, USA, Mar. 2025

## HONORS AND AWARDS

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Cornell Graduate School Travel Grant, 2024 (\$300 awarded)

University of Stuttgart Graduate Research Fellowship, 2023 (€2200 awarded)

Cornell Graduate School Travel Grant, 2023 (\$400 awarded)

National University of Singapore Engineering Colors Award, 2016

Awards for Study Abroad Exchange Scholarship, 2015 (\$2000 awarded)

Singapore Ministry of Education Senior-Middle 1 Scholarship, 2007-2011 (Approximately SGD\$150,000)

## TEACHING AND RESEARCH MENTORING

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**Bio-inspired Coordination of Multi-Agent Systems**, Fall 2024

Role: Guest Lecturer, “Exploiting Hybrid Dynamics for Collective Locomotion in Smart Matter.”

**Digital Logic and Computer Organization**, 2023

Role: Head Teaching Assistant, Laboratory Instructor, Discussion Instructor

Class Information: Weekly laboratory sessions, office hour and discussions, 100 sophomore students

**Embedded Systems**, 2020

Role: Teaching Assistant, Laboratory Instructor

Class Information: Weekly lab sessions, 60 senior students

**Student Mentees:**

Sophia Franklin, Undergraduate Student at Cornell University, 2023-2024

Austin Brown, Undergraduate Student at Cornell University, 2022

Greg Kaiser, Undergraduate Student at Cornell University, 2019-2020

## COMMUNITY SERVICE

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Peer reviewer for IEEE Robotics and Automation Letters

Host for New Vision Engineering Outreach Program, 2022

Organizer for a nationwide Rice Donation Drive and collected 3200 kg of food for more than 200 needy families in Singapore, 2011

More than 100 international volunteering service hours at primary schools in Vientiane, Laos, 2010-2011

## LEADERSHIP AND WORK EXPERIENCE

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President of NUS Electrical and Computer Engineering Club, 2014-2015

Founding Member of NUS ECE Undergraduate Student Council, 2014-2015

Producer and Chairperson of NUS King Edward VII Hall Chinese Drama, 2013-2014

Software Engineer Intern, Panasonic Automotive, Peachtree City, GA, USA, 2017

Digital Marketing Executive , Furen International School, Singapore, 2016

IT Analyst Intern, Credit Suisse, Singapore, 2015

Service Engineering Intern, Cummins Inc, Singapore, 2014