# Nancy Ouyang

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## EDUCATION

**Harvard University**
PhD candidate in Computer Science **Aug 2017 – now**

**Massachusetts Institute of Technology**
Bachelor of Science degree in Mechanical Engineering **June 2013**

## RESEARCH EXPERIENCE

**Harvard Statistics Department –** *Graduate student (under Lucas Janson)* **Sept 2017 – now**
Wrote simulation framework in Julia to assess feasibility and optimality of motion planning algorithms.

**MIT Biomimetic Robotics Lab** – *Research Assistant (under Sangbae Kim)* **Feb – Jul 2017**
Worked with senior graduate student Albert Wang, on safety metrics in motion planning for legged robots. Interfaced MATLAB dynamics simulation runs to PostgreSQL and ran database benchmarks.

## INDUSTRY EXPERIENCE

**VVV Academy –** *Technical Instructor* **Jan 2016** – **Dec 2016**
Developed and taught robotics curriculum for K5 -12 students. Began writing up intro to robotics book.

**Harvard Personal Genome Project –** *Staff* **Jul** – **Dec 2015**
Created new phenotype survey, provided technical support to researchers from other institutions.

**Curoverse –** *Researcher (under Alexander Wait Zaranek)* **Sep 2014 – Dec 2015**
Created open source genomics web applications in Python, initiated customer research interviews, presented to Global Alliance for Genomics and Health, ran non-credit month-long genomics class.

**MIT Office of Digital Learning –** *Contractor (under Isaac Chuang)* **Jan – May 2014**
With NarwhalEdu cofounder, took on contract work to investigate replacing the $5k robots in MIT's introductory EECS class with $200 robots that we prototyped.

**NarwhalEdu –** *Founder* **Jun 2013 – Sep 2014**
Accepted to Global Founder's Skills Accelerator 2013. Designed drawing robot arm kit and complementary online curriculum as an introduction to engineering EdX class. Reached close to 100 students with over $20k of sales (via Kickstarter) in our first year. See Kickstarter & EdX

**Fitbit –** *Research and Development Intern* **Jun – Aug 2012**
Evaluated prototypes of future product by writing MSP430 evaluation firmware, designing mechanical prototypes sent out for CNC machining, and analyzing experimental data in Pylab and MATLAB.

## TEACHING EXPERIENCE

**MIT International Design Center –** *Recitation Instructor (under Charles Guan)* **Jun – Jul 2013**
Assisted teaching a class where students from the Singapore University of Technology and Design spent six weeks designing and building their own electric go-kart to race at the end of the summer.

**MIT Office of Minority Education –** *Momentum Teaching Assistant* **Jan 2013**
Assisted a team of four freshmen and sophomores in designing and fabricating a prototype electrical vehicle charger that would improve handling of the thick gauge wire involved.

**MIT Department of Mechanical Engineering –** *Undergraduate Assistant* **Feb – May 2012**
Assisted with office hours, prototyping skills, for sophomore-level mechanical engineering class "Design and Manufacturing I".

## CONFERENCES

"The Rise and Fall of an Open Source Hardware Startup", Talk **19 Sep 2015**
**Open Hardware Summit**

"The Story of a Startup", Talk **28 Apr 2015**
**Nanyang Technological University, Boston Technopreneurship Forum**

Introduction to Making: Rapid 3D Fabrication at MIT and Beyond, Panel **03 Feb 2015**
**MIT Office of Digital Learning, xTalks**

"CopyCat Drawing Robot Arm", Demo **04 Oct 2013**
**Northeast Robotics Colloquium**

Curriculum and Program Innovation, Panel **20 Sep 2013**
**Production in the Innovation Economy Conference**

## INDEPENDENT PROJECTS

**Staubli Drawing Robot Arm** **Jan 2016**
With three other students, figured out how to power up, talk to, and safely use a Staubli robot arm made in 2004. Collaborated with London Hackerspace to get Staubli to accept g-code and carry out drawing instructions in 2D sharpie. Robot donated by Prof. Seth Teller.

**CAD Reading Group** **Oct – Dec 2015**
Started and led reading group with over twenty people to discuss and read papers on engineering software that aids in design, simulation, and analysis.

**Hackathon for Feminism** **Aug – Nov 2015**
Organized hackathon to engage engineers in a creative problem-solving outlook on feminist activism. Our speakers came from MIT Medical and the Boston Doula Project and we had over forty attendees.

**Sailboat Rudder** **Jun 2015**
Taught myself how to work with composites and built replacement rudder for 26 foot sailboat by creating a two-part CNC foam mold and using fiberglass, epoxy, and two-part expanding foam.

**Six-Legged Rideable Robot** **Jun – Aug 2011**
Built a six-legged rideable robot, derived from designs by Rick Pantaleo, and gave rides to kids at New York Maker Faire 2011 and 2012.

**18 Servo Hexapod** **Feb – May 2011**
Inspired by dancing hexapod Youtube videos, I independently designed, built, and programmed an 18 servo six-legged robot to walk in lieu of the normal class competition with the professor's permission.

## PUBLICATIONS

Guthrie, S., *et al.* Tiling the genome into consistently named subsequences enables precision medicine and machine learning with millions of complex individual data-sets. (2015). *PeerJ PrePrints* 3:e1426v1; doi.org/10.7287/peerj.preprints.1426v1 **12 Oct 2015**

Novak, B., *et al.* Genome Graphs. (2017). *bioRxiv* 101378; doi.org/10.1101/101378 **18 Jan 2017**

## GRANTS

**Boston Awesome Foundation,** Colorful Swarm of Robots **Nov 2014**
Designing twenty robots and associated dance choreography.

**de Florez Fund for Humor,** Hexapod Conference 2013 **04 Apr 2013**
Organized conference about legged robots with Prof. Sangbae Kim and Prof. Aaron Hoover as speakers and with over thirty attendees. Led team of six volunteer staff.

**MIT Department of Mechanical Engineering**, MITERS Seminar Series **16 Sep 2012**
Organized and co-taught workshops to introduce people to prototyping skills such as Solidworks, breadboarding, EAGLE, ordering boards, and more, reaching over fifty students.

## PRESS

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| “All in a Day's Play”, **MIT Technology Review** | 21 April 2015 |
| "When inspiring future roboticists, think small, think cute", **BetaBoston** | 13 Aug 2014 |
| "Gatttool, ubuntu, and Adafruit’s Bluefruit LE – NRF8001 Bluetooth low energy breakout in 20 minutes", **Adafruit** | 28 Jul 2014 |
| "Spotlight: Robots in STEM Education", **ASEE Accelerator** | 22 Jan 2014 |
| "Wicked Cool Education from NarwhalEdu", **Makezine** | 04 Dec 2013 |
| "Learn Engineering and Draw Narwhals", **Hackaday** | 22 Nov 2013 |

## AWARDS

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| **MAKE Pitch Your Prototype Finalist** | 21 Sep 2013 |
| **NYC Hackathon “Most APIs” Award** | 25 Mar 2012 |

## LEADERSHIP & SERVICE

**Open Source Hardware Association –** *Treasurer* **Apr 2013 – Apr 2014**
Prepared quarterly budget reports for 30k+ of assets.

**MIT Electronics Research Society –** *President* **Feb 2012 – Feb 2013**
A member-run creative haven and machine shop at MIT. Started and led student project grants and peer-to-peer workshop and seminar series.

**EECS Undergraduate Reading Group Experience** – *Group Leader* **Spring 2012**
Led discussion of papers on hexapods over five meetings with group of six fellow undergraduates.

## SKILLS

**Languages**: Chinese (intermediate), Spanish (beginner)
**Software:** Python, Java, C, MATLAB, Bash, Javascript, SQL. Vim. Wordpress, Inkscape, Lightworks.
**Hardware:** Solidworks, Eagle, machining (mill, lathe), lasercutter/waterjet, Atmel C