

# Han Zhang – Mechatronics Engineer

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## Education

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**University of British Columbia** **09/2012 – 05/2018**  
BAsC Engineering Physics, Mechatronic Science Option; Minor in Honours Math GPA: 84.2/100 (A-)

### *Honors and Awards*

- UBC-Chongqing Joint Undergraduate Research Forum 2018
- Eric A. Roenitz Memorial Award in Engineering Physics 2018
- John Collison Memorial Scholarship in Mathematics 2017
- Go Global Research Abroad Program Award 2016
- Huawei Seeds for the Future Program 2015
- TREK Excellence Scholarship 2013

### *Extracurricular Activities*

- Co-founder & Vice Captain, UBC Mars Colony Engineering Team 08/2016 – 04/2018
- Go Global Ambassador 08/2017 – 04/2018

## Employment History

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**Senior Systems Engineer** **01/2020 – present**  
*Celldom* *San Carlos, USA*

- Designed and built Celldom's first customer facing instrument, including optical, fluidics, and motorized subsystems.
- Designed fluidics controller PCB for Celldom's customer facing instruments.
- Programmed multithreaded python GUI to control optics actuation, feature autofocusing, cell imaging, and fluidics.
- Designed and built (internal facing) controller boxes, live biology instruments, interfacing components, and tools.
- Trained to produce microfluidics chips at the Stanford Nanofabrication Facility.

**R&D Engineer, Microfabrication Team** **11/2018 – 12/2019**  
*Neuralink* *San Francisco, USA*

- Designed PCBs and FPCs for electrical and electrochemical tests on micron scale electrode arrays.
- Designed mechanical fixtures and parts for material strength tests, electroplating jigs, sample polishing mounts.
- Fabricated thin film electrode devices with micron scale features using metal evaporators, mask aligners and silicon etchers.
- Assembled complex (~50 steps) neuro-medical devices and developed assembly and testing protocols for QA.
- Repaired and upgraded obsolete heavy equipment like old laser cutters, profilometers, solder jets, and vacuum ovens.

**Researcher** **05/2017 – 08/2017**  
*The Canadian National Institute for Nanotechnology* *Edmonton, Canada*

- Wrote LabVIEW software to automate flow, temperature and micro-actuator control for experiments.
- Made custom cable assemblies, installed fume hood lines for experiment setups.
- Eliminated major algorithm flaws of prior software, leading to clear results published in academic conferences.

**Cloaking Technology Researcher** **06/2016 – 07/2016**  
*Nanyang Technological University, SPMS* *Singapore*

- Designed built amplifier and filter circuits, conducted experiments measuring efficacy of a magnetic field cloaks.
- Debugged persistent signal issues that have eluded past student researchers, leading to conference publication.

**Physics Research & Engineering Intern** **05/2015 – 12/2015**  
*Max Planck Institute for the Structure and Dynamics of Matter* *Hamburg, Germany*

- Wrote LabVIEW programs and designed mechanical fixtures to create an automated system for dispensing picoliters per second of sample solution onto an array of 100 micron diameter wells with high reproducibility.
- Developed production protocol of a highly acidic gel for pairing with LAESI methods, acquiring pharmaceutical companies' funding for the lab group with its promising results.

**Web Design & Web-mapping Intern** **01/2014 – 04/2014**  
*Environment Canada* *Vancouver, Canada*

- Created a front end web UI using PHP for users to subscribe to government weather alerts that was first deployed for the 2015 Pan-Am Games.
- Implemented database structures with SQL to link and sort incoming weather alerts to subscribers.

## Technical Projects

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### Modular Bioreactor for In-vitro Meat Research (3 people)

08/2017 – 05/2018

University of British Columbia, Engineering Physics Project Lab

- Pitched a capstone project idea to leaders in the cultured meat industry and initiated the bioreactor project with New Harvest.
- Designed and built the bioreactor chassis, inner structural components, cell trays and a peristaltic pumping system.
- Designed and installed a temperature control system for the bioreactor.
- Managed \$3000 in project funding, project was showcased at the 2018 New Harvest Conference in the MIT Media Lab.

### STROBE System (2 people)

09/2016 – 04/2017

University of British Columbia, Engineering Physics Project Lab

*STROBE (Sip TRiggered Optogenetic Behavioral Enclosure): Project goal was to create an optogenetics module that can attach to a pre-existing fruit fly feeding experiment platform, and allow for automated delivery of light stimuli to flies, triggered by their feeding behavior.*

- Designed optogenetics lighting PCB and PCB mechanical housing with ambient light shields and easy pipette access.
- Group's project won the department's Eric Roenitz Memorial Award for project ingenuity (one per year).
- Lead to part time employment to build more systems, revamp design for high humidity, and install UV lighting modules.

### Interactive Smart Mirror (2 people)

09/2016 – 12/2016

University of British Columbia, Department of Mechanical Engineering

- Designed and 3D printed frame components to mount a one-way mirror onto a monitor.
- Designed and laser cut aesthetic, secure housings for a Raspberry Pi and ultrasound and infrared sensors.
- Built sensor circuits and debugged gesture detection algorithm.

### Automated Magnetic Field Tracking Rover (4 people)

01/2015 – 04/2015

University of British Columbia, Department of Electrical Engineering

- Built filter and amplifier circuits to process signals coming from inductor coils detecting a magnetic field track.
- Programmed rover microcontroller for PID driving control and reliable intersection decision making.
- Robot navigated entire course autonomously and won second place for track time.

### Automated Tape & IR Following Artifact Collector (4 people)

05/2014 – 08/2014

University of British Columbia, Department of Physics and Astronomy

- Designed and fabricated robot chassis parts with waterjet and laser cutters.
- Designed and built a motor H-bridge circuit out of basic transistors (MOSFETs and BJTs)
- Wrote PID drive control code to achieve steady driving and a perfect artifact collection rate.

## Publications

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### Journal Articles

1. P. Musso, P. Junca, M. Jelen, D. Feldman-Kiss, **H. Zhang**, R. Chan, M. Gordon, Jul. 19, 2019, "Closed-loop optogenetic activation of peripheral or central neurons modulates feeding in freely moving *Drosophila*", *eLife Sciences*.
2. A. Jaeger, M. Stanley, Z. Weiss, P. Musso, R. Chan, **H. Zhang**, D. Feldman-Kiss, M. Gordon, Oct. 11, 2018, "A complex peripheral code for salt taste in *Drosophila*", *eLife Sciences*.
3. K. Bosnick, L.-L. Tay, J. Bruce, B. Smith, **H. Zhang**, C. Schwartz, May 13, 2018, "Meat spoilage sensing devices", *TechConnect briefs 2018: Advanced Materials. Vol. 3 Biotech, Biomaterials and Biomedical*

### Conferences

1. J.B. Ozdoba, B. Smith, **H. Zhang**, C. Schwartz and K. Bosnick, 2018, "Zinc Oxide Sensing Devices for Meat Spoilage", *101st Canadian Chemistry Conference*, Edmonton, Canada, Feb. 27-31.
2. H. Xu, K. G. Kawtilyaa, F. Y. Tay, **H. Zhang**, S. K. Krishnaraj, and B. Zhang, 2016, "Geometrical Invisibility Cloak for Diffusion Fields", *Progress In Electromagnetics Research Symposium*, Shanghai, China, Aug. 8-11.

## Professional Associations

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- EIT, Engineers and Geoscientists of British Columbia 05/2018 – Present