PETER GODART

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EDUCATION

- **MIT**, S.B. in Mechanical and Electrical Engineering, June 2015 (GPA: 4.9/5.0)
- **MIT,** S.M. in Mechanical Engineering, June 2019 (GPA: 5.0/5.0) – Thesis: *Design of an Aluminum-Powered Reverse Osmosis Desalination System for Disaster Relief*
- **MIT,** Ph.D. candidate in Mechanical Engineering, Expected Graduation June 2021 (GPA: 5.0/5.0)

WORK / RESEARCH EXPERIENCE / PROJECTS

- **Governor's School (Summer 2010)**: Worked in a Rutgers lab to develop technique for sequestering atmospheric CO_2 using nanoparticles and enzymes that convert the greenhouse gas to bicarbonate.
- **Panasonic, Intern (Summer 2011)**: Led a team in the design of an engineering competition for NJ high school students. Created a Mars rover-themed challenge requiring participants to construct, from household items, a robot that could perform a number of Mars operation-related tasks. Built a solution to prove feasibility.
- **MIT Lifelong Kindergarten Group, Research Assistant (Summer 2012)**: Designed/fabricated new circuit boards with Bluetooth wireless and I^2C network capabilities for a self-documenting construction kit. Wrote software for project using computer vision and "simple machine" models to teach young students about mechanics.
- **MIT 2.00b, "Toy Lab"**: Worked on a team of 5 to design and prototype original toy, BeatBlocks, a set of cubes that emit music samples in response to simple hand gestures.
- **MIT 6.115 (2014)**: Extensive project work with 8051 microcontroller. 2-axis MRI, fluorescent light ballast, motor controller, phase-locked loops, music playback and amplification.
- **Two Bit Circus, R&D Engineer (2014)**: Designed and built STEM-related carnival attractions, including several robotic musical instruments. Extensive rapid prototyping work in metal, wood, plastic, and electronic media.
- **MIT 2.013/2.014, CEO (Fall 2014 - Spring 2015)**: Capstone product development class funded by the US Marines and Lincoln Laboratories. I led a 10-person team to develop a tactical 3kW power generator that reduces the total volume of fuel necessary for a standard Marine mission. We succeeded in developing a novel system that reacts aluminum and water to produce hydrogen and run a fuel cell. The result was a 60% reduction in volume.
- **NASA JPL, Roboticist (August 2015 – August 2017)**: Lead arm analyst and arm system engineer for the Mars Science Laboratory Rover (Curiosity), project manager for development of modular robotics software and novel power systems for a Europa lander, developer for control software subsystem for upcoming Mars 2020 mission.
- **MIT 2.013/2.014, Teaching Assistant / Instructor (Fall 2017 – present)**: Co-instructor for capstone design course for both undergraduate and graduate mechanical engineering students. I devise and plan term projects, lectures, and advise students on technical content. Past successful projects include a carbon neutral cooling system, an aluminum-powered BMW i3, and an autonomous ionosphere mapping ocean platform.
- **MIT PhD Candidate (Spring 2019 – present)**: Conduct research in aluminum-based fuels, sustainable power systems, relief for climate change-related natural disasters, and climate-change adaptation in general. Current projects include fundamental research on aluminum-water reactions, an aluminum debris-powered desalination system, and various devices for cooking and generating electricity using scrap aluminum in the developing world.

SKILLS / RESEARCH INTERESTS

- **Programs / Programming Languages**: Assembly, C, C++, Python, Go, MATLAB, Linux, SolidWorks, Fusion 360, Eagle, Arduino, Processing, Adobe Creative Suite, Pure Data, Max/MSP, Sibeliu
- Real-time robotics control software, mechatronics/mechanical/circuit design, custom microcontrollers, PCB layout and milling, analog filter design, rapid prototyping. Significant experience with laser cutting, 3D printing, water jet cutting, CNC, lathes, mills, MIG/TIG welding, and standard shop tools.
- Thermodynamics, heat transfer, fluid mechanics, desalination, aluminum-water reactions, hydrogen power systems

AWARDS

- **First Place, Panasonic Creative Design Challenge (2010, 2009, and 2008)**: Challenge to complete complicated tasks with robots made from household items. First out of 60 teams. Received NJ gubernatorial proclamation.
- **Second Place, Panasonic Creative Design Challenge (2011)**: See above for challenge description.
- **MENC Top ranked high school jazz pianist in northeast region encompassing 12 states (2011)**
- **Emerson Fellowship (2011-pres.)**: A fellowship for taking music classes at the New England Conservatory
- **Pi Tau Sigma, MIT (2013-2015):** Engineering honor society (top 15% of class)
- **MIT Louis Sudler Prize (2015)**: Top prize for excellence in the arts (music)
- **Hertz Fellow Finalist (2018)**

- **First Place, Tech Briefs Create the Future Contest (2018)**: aluminum-powered emergency generator
- **MIT Office of Sustainability Incubator Award (2019)**: $50k to develop project class on carbon-neutral cooling
- **MIT Keck Travel Award in Thermal Sciences (2019)**: competitive travel grant for MechE grad students
- **Martin Family Society Fellow for Sustainability (2019)**
- **Hugh Hampton Young Fellow (2019)**
- **J-WAFS Fellow for Water Solutions (2019)**
- **MIT-LL Barbara P. James Memorial Award (2015 and 2019)**: For excellence in project-based engineering

PUBLICATIONS

1. S. Brooks, P. Godart, P. Backes, S. B. Chamberlain, R. Smith, and S. Karumanchi, "**An Untethered Mobile Limb for Modular In-Space Assembly**," IEEE Aerospace Conference, 2016.
2. S. Brooks, P. Godart, B. Chamberlain-Simon, R. Smith, and P. Backes, "**Limboid Reconfigurable Robots for In-Space Assembly**", NASA Tech Briefs, Vol. 40 No. 6, June 2016.
3. P. Godart, J. Gross, and R. Mukherjee, "**Generating Real-Time Robotics Control Software from SysML,**" IEEE Aerospace Conference, 2017.
4. R. Mukherjee, N. Abcouwer, J. Kim, R. McCormick, P. Bailey, and P. Godart, "**Technologies for Mars On-Orbit Robotic Sample Capture and Transfer Concept**," IEEE Aerospace Conference, 2017.
5. P. Godart et al, **"Auto-Generating Real-Time Capable Robotics Control Software for Highly Reconfigurable Robot Platforms."**, 2018 IEEE Aerospace Conference, 2018.
6. P. Godart et al, **"Hydrogen Production from Aluminum-Water Reactions Subject to Varied Pressures and Temperatures"**, International Journal of Hydrogen Energy, 2019, DOI: 10.1016/j.ijhydene.2019.03.140.
7. P. Godart, D. Douglas, D.P. Hart, **"An Ecosystem for Powering Seawater Desalination with Recycled Aluminum"**, IDA World Congress, Dubai, UAE, October, 2019. (Accepted for oral presentation)
8. P. Godart, J. Fischman, D.P. Hart, **"High-Power Fuel Cell Systems Fueled by Recycled Aluminum"**, Proceedings of the ASME 2019 International Mechanical Engineering Congress and Exposition (IMECE), Salt Lake City, Utah, USA, November, 2019 (Accepted for oral presentation).

PATENTS

1. P. Godart, "Musical instrument recording system", US Patent US10311844B1, issued June 4, 2019.
2. P. Godart, D.P. Hart, "Pressure-Driven Treatment of Fluid (HDRO)", US Patent Application No. 16/548,137, filed August 22, 2019.

SPEAKING ENGAGEMENTS / PRESENTATIONS

1. American Helicopter Society, Cambridge MA, October 25, 2017. "Powering the World with Soda Cans".
2. IEEE Aerospace Conference, 2018. "Auto-Generating Real-Time Capable Robotics Control Software for Highly Reconfigurable Robot Platforms". (Electronic Presentation Hall).
3. MIT Mechanical Engineering Research Exhibition, Cambridge, MA, September 28, 2018. "Powering Disaster Relief with Aluminum" (poster). *Honorable Mention*.
4. Polytechnic University of Puerto Rico, San Juan, PR, January 21, 2019. "Aluminum-Powered Disaster Relief".
5. MIT Water Night, Cambridge, MA, February 26, 2019. "Aluminum-Powered Desalination" (poster). *Best Poster Award.*
6. MIT Sustainability Connect, Cambridge, MA, May 3, 2019. "Designing the future of sustainability education at MIT" (panel participant).
7. Applied Energy A+B Conference, Cambridge, MA, May 24, 2019. "Aluminum-Powered Climate Change Resiliency".
8. World Hydrogen Technologies Convention, Tokyo, Japan, June 4, 2019. "Control of Aluminum-Water Reactions for Hydrogen Production" (poster).
9. International Desalination Association World Congress, Dubai, UAE, October 21, 2019. "An Ecosystem for Powering Seawater Desalination with Recycled Aluminum".