David Doan

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Education

Stanford University — *Present*
Master of Science (M.S.), Ph.D. Candidate, Mechanical Engineering — *Stanford, CA*

Massachusetts Institute of Technology (MIT) — *June 2017*
Bachelor of Science (B.S.), Mechanical Engineering (Course 2) — *Cambridge, MA*

Experience

Gu Lab, *Researcher* — *Sept 2017 - Present*
Relativity Space, *Mechanical Engineering Intern* — *Jun - Sept 2017*

- Development of a novel, automated manufacturing process
- Development of in-house toolpath planning for said manufacturing process

MIT Lincoln Beaver Works Center, *Researcher* — *Jan - Jun 2017*

- Designed a benchtop system to convert a 1kW generator (four-stroke) to run on hydrogen produced by an Al-H_2O reaction by carburetor injection
- Designed a benchtop system to convert a 1.2kW airplane engine (two-stroke) to run on hydrogen by continuous direct injection at top dead center (TDC) that resulted in higher power density

MIT Global Engineering and Research (GEAR) Lab, *Researcher* — *Sept 2016 - Jun 2017*

- Developed MATLAB code in order to decrease the cost of solar powered, drip irrigation systems in developing countries
- Modelled drip-irrigation systems by coupling several subsystem models (solar, pump, water consumption etc.)
- Cost-optimized the system configuration (specific PV, specific water pump, tilt and azimuth angle, etc.) using a genetic algorithm for several different plants for the specific location of Jalgaon, India

Tesla Motors, *Drive Systems Engineering Intern* — *Jun - Sept 2016*

- Designed dozens of locating and test fixtures for automated equipment for the current and future stator manufacturing lines
- Researched and implemented automated vision systems to detect defects in stators during the winding stage to prevent rework and scrap
- Analyzed and calculated detailed numbers for future stator lines in order to ensure smooth process flows and provide quantitative metrics for automated deliveries
- Designed and modelled concepts for automated ceramic breaking to reduce cycle times

Space Exploration Technologies (SpaceX), *Avionics Engineering Intern* — *Jun - Aug 2015*

- Developed, from design to implentation, a first prototype for automated mechanical testing of >80% of all harness connectors in Falcon 9 and Dragon vehicles
- Designed and implemented over a dozen tooling solutions for several harnesses in order to decrease cycle times and rework
- Identified root cause, tested, and developed a solution for a mechanical issue on Dragon harnesses to prevent mechanical failure and rework

Publications

Kiani, Mehrdad T., Christopher Michael Barr, Shicheng Xu, **David Doan**, Zhaoxuan Wang, Abhinav Parakh, Khalid Hattar, and X. Wendy Gu. "Ductile Metallic Glass Nanoparticles via Colloidal Synthesis." *Nano Letters* (2020).

Patil, Radhika P., **David Doan**, Zachary H. Aitken, Shuai Chen, Mehrdad T. Kiani, Christopher M. Barr, Khalid Hattar, Yong-Wei Zhang, and X. Wendy Gu. "Hardening in Au-Ag nanoboxes from stacking fault-dislocation interactions." *Nature Communications* 11, no. 1 (2020): 1-9.

Parakh, Abhinav, Sangryun Lee, K. Anika Harkins, Mehrdad T. Kiani, **David Doan**, Martin Kunz, Andrew Doran, Lindsey A. Hanson, Seunghwa Ryu, and X. Wendy Gu. "Nucleation of Dislocations in 3.9 nm Nanocrystals at High Pressure." *Physical Review Letters* 124, no. 10 (2020): 106104.

Conferences

The Minerals, Metals & Materials Socierty (TMS) — *February 2020*
Annual Meeting & Exhibit — *San Diego, CA*
Talk: *"Programmable Self-Assembly of 3D Printed Particles"*

Materials Research Society (MRS) — *December 2019*
Fall Meeting & Exhibit — *Boston, MA*
Talk: *"Programmable Self-Assembly of 3D Printed Particles"*

Gordon Research Conference (GRC) — *July 2018*
Thin Film and Small Scale Mechanical Behavior — *Lewiston, ME*
Poster: *"Femtosecond laser additive manufacturing of nanocrystalline metallic nanostructures"*

Teaching

ME 340: Elasticity and Inelasticity — *Fall 2019*
Stanford University, Course Assistant (CA)

Leadership

Founding Member, Board Member, Director — MakeMIT — *Sept 2013 - Feb 2015*

Founding Board Member — Design for America — *Sept 2014 - Jun 2015*

Awards and Honors

Questbridge Scholar — Massachusetts Institute of Technology — *2013 - 2017*

National Science Foundation (NSF) Research Fellow — Stanford University — *2017 - 2020*