

ADAM G. STEVENS

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EDUCATION

Massachusetts Institute of Technology, Cambridge, MA

Ph.D., Mechanical Engineering, G.P.A.: 4.70/5.00

Awarded Sept. 2021

Thesis: *High throughput extrusion additive manufacturing - rate limits and system design*

S.M., Mechanical Engineering, G.P.A.: 4.50/5.00

Awarded Sept. 2015

Thesis: *A Robotic System for Photopatterning of Freeform Surfaces*

Select Courses: Manufacturing, Solid Mechanics, Precision Machine Design, Nanoengineering

University of Michigan, Ann Arbor, MI

B.S.E., *summa cum laude*, Mechanical Engineering, G.P.A.: 3.85/4.00

Awarded May 2013

Mathematics Minor

Select Courses: Design & Manufacturing I-III, Controls, Materials, Solid Mechanics, Probability

EXPERIENCE

Associate Research Staff Member – Oak Ridge National Laboratory

Oct. 2021-Present

- Technical lead public-private collaboration to develop composite additive manufacturing materials for renewable energy applications
- Systems integration engineer for large-scale mechanical testing system development and a gantryless additive manufacturing platform

Graduate Student Researcher – MIT Mechanosynthesis Group

June 2013-Sept. 2021

- Researching methods for high-throughput additive manufacturing of thermoplastic composites informed by underlying process physics
- Implemented a multithreaded C++ software program for coordinating a 7-axis movement system for lithographically patterning arbitrarily curved substrates
- Managed Undergraduate Research Opportunity Program (UROP) students via consultation and assignment of deliverables

Design Engineer Intern – Desktop Metal

May-Aug. 2016

- Designed precision vertical motion stage for printer prototype, meeting functional requirements of 50 micron or better repeatability with load ranging from 0 to 10kg
- Worked with multiple subsystem design teams to meet functional requirements while staying under budget
- Incorporated learnings from first prototype and worked with stakeholders to recommend a design for the second prototype that was subsequently incorporated into the production Desktop Metal Studio System

Undergraduate Researcher – U. of Michigan Mechanosynthesis Group

May 2011-May 2013

- Developed a process for low-cost patterning of carbon nanotubes based on laser printing of magnetic toner particles
- Created thin transfer process for laser-printed micro-patterns resulting in a publication, conference proceeding, and a patent
- Explored the use of flexible metal substrates for carbon nanotube growth

Composite Engineer Intern – Molecular Rebar Design, LLC

May-Aug. 2012

- Formulated and tested unsaturated polyester nanocomposites to meet customer requirements and capture intellectual property
- Optimized laboratory waste stream to minimize downtime and costs while increasing safety
- Trained personnel on proper use of tensile testing, thermogravimetry, and Fourier-transform infrared spectroscopy equipment

PUBLICATIONS & PATENTS

Papers in Refereed Journals

- J. Go, S. N. Schiffres, **A. G. Stevens**, A. J. Hart. Rate limits of additive manufacturing by fused filament fabrication and guidelines for high-throughput system design. *Additive Manufacturing* 16:1-11, 2017.
- **A. G. Stevens**[†], C. R. Oliver[†] ([†]equal contribution), M. Kirchmeyer, J. Wu, L. Chin, E. S. Polsen, C. Archer, C. Boyle, J. Garber, A. J. Hart. Conformal Robotic Stereolithography. *3D Printing and Additive Manufacturing* 3(4):227-235, 2016.
- E. S. Polsen[†], **A. G. Stevens**[†] ([†]equal contribution), A. J. Hart. Laser Printing of Nanoparticle Toner Enables Digital Control of Micropatterned Carbon Nanotube Growth. *ACS Applied Materials & Interfaces* 5(9):3656-3662, 2013.

Refereed Conference Proceedings

- A. C. Roschli, B. K. Post, C. E. Atkins, **A. G. Stevens**, P. C. Chesser, K. D. Zaloudek, “Build Plate Design for Extrusion-Based Additive Manufacturing,” *Solid Freeform Fabrication Symposium*, Austin, TX, 2022.
- **A. G. Stevens**, J. Go, A. J. Hart, “High-throughput Desktop-scale Extrusion Additive Manufacturing,” *Solid Freeform Fabrication Symposium*, Austin TX, 2017.
- **A. G. Stevens**, C. R. Oliver, L. Chin, A. J. Hart, “Photopatterning of freeform surfaces using a modular robotic system,” *Solid Freeform Fabrication Symposium*, Austin TX, 2015.
- E. S. Polsen, **A. G. Stevens**, A. J. Hart, “Scalable growth of patterned carbon nanotube arrays enabled by laser printing of the catalyst,” *Materials Research Society Fall Meeting*, Boston MA, 2012.

Patents

- A. J. Hart, **A. G. Stevens**, C. R. Oliver, J. Wu, C. Archer, 2019, “Systems, Devices, and Methods for Printing on Three-Dimensional Objects,” U.S. Patent 10,345,703 B2

TECHNICAL SKILLS

Platforms & Languages: C++, MATLAB, ROS, Simulink, V+, Visual Basic

Applications: COMSOL, ControlDesk, dSpace, LabView, Maple, Mathematica, Microsoft Office, Onshape, Simulink, SolidWorks

Characterization: Experienced with scanning electron microscopy, thermogravimetric analysis, small-angle X-ray scattering, atomic force microscopy, profilometry, optical microscopy; familiar with Fourier-transform infrared spectroscopy, dynamic mechanical analysis, and dynamic light scattering analysis

Chemical Synthesis: Experienced with chemical-vapor deposition growth of carbon nanotubes and formulation of unsaturated polyester resin nanocomposites

Machining: Experienced with mill and lathe operation

SYNERGISTIC ACTIVITIES

Professional society memberships: ASME, ASTM, SME

AWARDS

National Defense Science & Engineering Graduate Fellowship

Robert M. Caddell Memorial Scholarship (for outstanding research on materials & manufacturing)

James B. Angell Scholar – Winter 2012 (4.0 GPA for two consecutive terms)

University Honors – Fall 2009, Fall 2010, Winter 2011, Fall 2011, Winter 2012

Dean’s List – Fall 2009, Fall 2010, Winter 2011, Fall 2011, Winter 2012, Fall 2012, Winter 2013