

C. RYAN OLIVER

croliiver@umich.edu

EDUCATION

- 2010-2014 UNIVERSITY OF MICHIGAN Ann Arbor, MI**
Doctorate of Philosophy in Mechanical Engineering
GPA:4.00/4.00
Advisor: Prof. John Hart
Thesis: High throughput photopatterning and interactive manipulation of microparticles and microorganisms
- 2008 UNIVERSITY OF TEXAS AT ARLINGTON Arlington, TX**
Masters of Science in Industrial & Manufacturing Systems Engineering
GPA: 3.88/4.00, June 2008
Advisor: Prof. John Priest
Thesis: Sealing and Lamination of Microfluidic Devices
- 2007 UNIVERSITY OF TEXAS AT ARLINGTON Arlington, TX**
Bachelor of Science - Industrial & Manufacturing Systems Engineering
GPA: 3.78/4.00, June 2007, summa cum laude

APPOINTMENTS

- 2016-Present UNIVERSITY OF MICHIGAN Ann Arbor, MI**
 - Postdoctoral Associate, Internal Medicine, Biomedical Engineering
- 2014-2016 MASSACHUSETTS INSTITUTE OF TECHNOLOGY Cambridge, MA**
 - Postdoctoral Associate, Mechanical Engineering, Laboratory for Manufacturing and Productivity

ACADEMIC EXPERIENCE

- 2013-2014 MASSACHUSETTS INSTITUTE OF TECHNOLOGY Cambridge, MA**
 - Visiting scholar, Mechanosynthesis Group (Advisor Prof. John Hart)
- 2010-2014 UNIVERSITY OF MICHIGAN Ann Arbor, MI**
Graduate Research Assistant, Mechanosynthesis Group (Advisor Prof. John Hart)
 - Designed and built a high throughput maskless lithography system
 - Used the system to investigate the ability to dynamically pattern the microenvironment in response to feedback from an imaging system.
 - Reduced carbon nanotube variation by designing and building a fully automated CVD furnace.
 - Studied factors related to variation and property control in CVD growth in Carbon Nanotubes.
- 2004-2008 UNIVERSITY OF TEXAS AT ARLINGTON Arlington, TX**
2007-2008 Graduate Research Assistant
 - **Thesis:** Sealing and Lamination of Microfluidic Devices
 - Developed Mass Manufacturing Process for Alternative Energy Micro Devices (Bio-fuels/Coal Liquefaction) Patented

- Improved model, design of micro reactors for functionality, manufacturability, assembly and service
- Developed novel method for dimensional testing and validation of micro devices used in parallel processing of fluids

2006 Undergraduate Research Assistant

- Gathered and analyzed data on hand tool injuries from 1996-2006

HONORS AND AWARDS

- NIH T32 Cancer Biology Training Fellowship, 2016-2018
- Featured in MIT News for work on micro-particle synthesis. 2013
- Microfluidics and Biomedical Sciences Training Program (MBSTP) via NIH Fellowship, 2012-2014
- University of Michigan Mechanical Engineering Departmental Fellowship, 2010
- Outstanding Graduate Student, University of Texas at Arlington Graduate Program, Featured in UTA Research Magazine and Dallas Morning News, 2008
- Engineering Deans Fellow, College of Engineering, University of Texas Arlington, 2007, 2008
- SMART Fellow, Department of Defense 2006-2007
- Outstanding Senior, DFW Institute of Industrial Engineers, 2006
- GT Stevens Scholarship, Industrial and Manufacturing Systems Engineering Department, University of Texas at Arlington, 2005
- Ranked 1st in BS Graduating Class
- University Scholar, University of Texas Arlington, 2006-2007
- Merit Scholar, Hardin-Simmons University, 2002-2004
- Texas Pell Grant, 2004-2007
- Dean's Honor Roll, 2005-2007

PUBLICATIONS

2017

12. C. Ryan Oliver, Jungsoo Chang, Sofia Merajver, Shuichi, Takayama. Additive Manufacturing in Cancer Biology (Review). (2017). (In preparation).
11. C. Ryan Oliver, Megan Altemus, Brendan Leung, Aki Morikawa, Michele Dziubinski, Maria Castro, Shuichi, Takayama, Sofia Merajver. Analysis of metastatic potential by breast cancer type through a microfluidic blood-brain niche. (2017). (In preparation).
10. C. Ryan Oliver, Lillian Chin, Nathan Spielberg, David Dellal, John Lewandowski, Felix Sun, A. John Hart. Digital micro-assembly for flexible high-density electronics by photopatterning and machine vision feedback. (2017). (In preparation)
9. Wenbo Shi¹, Jinjing Li, Erik S. Polsen, C. Ryan Oliver, Yikun Zhao, Eric R. Meshot, D. Howard Fairbrother, A. John Hart, Desiree L. Plata. Oxygen-promoted catalyst sintering and implications for vertically aligned carbon nanotube synthesis. (2017). *ACS Nano*.

2016

8. C. Ryan Oliver, Adam Stevens, Matthieu Kerchmeyer, Jieyuan Wu, Lillian Chin, Erik Polsen, Chad Archer, Casey Boyle, Jenna Garber, A. John Hart. Conformal robotic stereolithography. (2016). *3D Printing and Additive Manufacturing*.
7. Hangbo Zhao, Jeong Jae Wie, Davor Copic, C. Ryan Oliver, Alvin Orbaek White, Sanha Kim, A. John Hart. Scalable high-fidelity fabrication of glassy liquid crystalline polymer microstructures by replica molding. (2016) *ACS Applied Materials and Interfaces*.
6. C. Ryan Oliver, E. Gourgou, D. Bazopoulou, N. Chronis, A. John Hart. On-demand isolation and manipulation of *C. elegans* by in vitro maskless photopatterning. (2016) *PLOS One*. doi: 10.1371/journal.pone.0145935

2014

5. Richard Billo, C. Ryan Oliver, Rachaneewan Charoenwat, Brian H Dennis, Paul A Wilson, John W Priest, Heather Beardsley. A cellular manufacturing process for a full-scale biodiesel microreactor. (2014) *Journal of Manufacturing Systems*. doi: 10.1016/j.jmsy.2014.07.004

2013

4. C. Ryan Oliver, William Westrick, Jeremy Koehler, Anna Brieland-Shoultz, Ilias Anagnostopoulos-Politis, Tizoc Cruz-Gonzalez, and A. John Hart. Robofurnace: A semi-automated laboratory CVD system for high-throughput nanomaterial synthesis and process discovery. (2013) *Review of Scientific Instruments*. 84(11):115105, doi:10.1063/1.4826275
3. C. Ryan Oliver, Erik Polsen, Eric R. Meshot, Sameh Tawfick, Sei Jin Park, M. Bedewy, and A. John Hart. Statistical analysis of variation in laboratory growth of Carbon Nanotube forests and recommendations for improved consistency. (2013) *ACS Nano*, 7 (4), 3565-3580. doi: 10.1021/nn400507y

2012

2. G.D. Nessim, A. Al-Obeidi, H. Grisaru, E.S. Polsen, C.R. Oliver, T. Zimrin, A.J. Hart, D. Aurbach, C.V. Thompson. Synthesis of tall carpets of vertically aligned carbon nanotubes via

in situ generation of water vapor by preheating of added oxygen. (2012) *Carbon*, 50, 4002-4009. doi: 10.1016/j.carbon.2012.04.043

1. Tawfick, S., De Volder, M., Copic, D., Park, S. J., Oliver, C. R., Polsen, E. S., Roberts, M. J. and Hart, A. J. (2012), Engineering of Micro- and Nanostructured Surfaces with Anisotropic Geometries and Properties. *Adv. Material*, 24: 1628–1674. doi: 10.1002/adma.201103796

CONFERENCES AND PRESENTATIONS

2017

Brain Metastases Research and Emerging Therapy – “Development of a blood brain niche microfluidic device and algorithms to aid diagnosis of metastatic potential.”

American Association for Cancer Research – “Analysis of metastatic potential by breast cancer type through a microfluidic blood-brain niche.”

NAMSED – “TEER study of barrier integrity, transport and extravasation across barrier systems such as human intestinal organoids and the blood-brain barrier.”

Materials Research Society – “Controlling convection in rehydrating aqueous two-phase systems.”

2016

Materials Research Society – “Template-Free Photoanchoring of Micro-Scale Objects for Manufacturing of Ultra-Miniature Electronic Devices.”

American Association for Cancer Research – “Novel microfluidic blood-brain niche to study breast cancer metastasis to the brain.”

Microfluidics in Biomedical Training Program – “Novel microfluidic blood-brain niche to study breast cancer metastasis to the brain.”

2015

Materials Research Society – “Discrete Object Additive Manufacturing (DOAM): Digital Three-Dimensional Printing of Cells and Microbeads within Hydrogel Matrices.”

Materials Research Society – “Scalable Fabrication of Stimuli-Responsive Liquid Crystalline Polymer Microstructures by Replica Molding.”

Solid Freeform Fabrication Conference – “Photopatterning of freeform surfaces using a modular robotic system.”

Solid Freeform Fabrication Conference – “Dynamic printing of cells and microbeads for custom microfluidic assays.”

C. elegans International Conference – “Real-time behavioral study of C. elegans by dynamic in situ photopatterning of hydrogel assays.”

- 2014**
- MARC 2015 – “Robotic photopatterning of large 3D surfaces.”
- Materials Research Society – “A Robotic Lithography System for Micropatterning of Large 3D Surfaces.”
- Miniaturized Systems for Chemistry and Life Sciences (μ TAS) - “Platform for in-vitro photo-patterning of whole animal *C. elegans* assays and behavior control.”
- Autonomous Research Systems for Materials Development Workshop
- Microfluidics and Biomedical Sciences Training Program (MBSTP) Annual Symposium – “Real-time motion tracking and synthesis of microparticles within a continuous flow”
- National Institute of Biomedical Imaging and Bioengineering (NIBIB) Conference – “Real-time motion tracking and synthesis of microparticles within a continuous flow”
- 2013**
- Enabling Nanofabrication for Rapid Innovation (ENRI) – “A flexible system for microfluidic particle lithography and real-time shape identification”
- Microfluidics and Biomedical Sciences Training Program Annual Symposium – “Maskless optofluidic synthesis of precision polymer microparticles for biointerfaces”
- MBSTP Seminar series – “Maskless optofluidic synthesis of precision polymer microparticles for biointerfaces”
- 2012**
- University of Michigan WIMS Industrial Advisory Board Symposium – “Robofurnace: An automated CVD system for reduced CNT growth variation and high-throughput experimentation”
- University of Michigan Graduate Symposium – “Identifying the primary causes of variability in lab-scale growth of carbon nanotube films”
- Materials Research Society – “Identifying the primary causes of variability in lab-scale growth of carbon nanotube films”
- Materials Research Society – “A reconfigurable system for maskless microfluidic lithography of microstructured polymer particles and surfaces”
- 2011**
- Materials Research Society – “Robofurnace: An automated CVD system for reduced CNT growth variation and high-throughput experimentation”

- 2008** IIE Student Chapter Guest Speaker - “An Introduction to Microsoft Access”
- 2007** Institute of Industrial Engineers Student Conference – “Process design of plastics product manufacture through simulation”

PATENTS

- Hart, A. J., Oliver, C.R., Stevens, A.G., Wu, J., Archer, C.R., “Systems, devices, and methods for printing on three-dimensional objects,” US Patent App. No. 14/953,287. Patent Pending.
- Hart, A.J., Oliver, C.R., “Systems, devices, and methods for printing objects inside of three-dimensional printed objects.”, US Patent App. No. 62/261,831. Patent Pending.
- Dennis, B.H., Billo, R.E., Priest, J.W., Kolesar E.S., Oliver, C.R., “Methods and Systems for Improved Biodiesel Production,” US Patent No. 8,404,005, Mar. 2011.

ACADEMIC AND PROFESSIONAL ASSOCIATIONS

- Institute of Industrial Engineering member 2006-Present
- American Society of Mechanical Engineers member, 2012-Present
- Materials Research Society member, 2011-Present
- American Association for Cancer Research, 2016-Present

LEADERSHIP AND ACTIVITIES

- Program committee member for IEEE Nano, 2017.
- Undergraduate research advisor and mentor to twelve students from 2008-Present
- Executive board member of Microfluidics and Biomedical Sciences Training Program, 2012,2013
- Executive committee member of the Nanotechnology and Integrated Microsystems Student Association, 2012
- Executive committee member of the University of Michigan Graduate Symposium, 2011
- President of Institute of Industrial Engineering, UTA chapter, 2006-2007
- Officer Alpha Pi Mu, UTA Chapter, Industrial Engineering Honors Society, 2007
- Officer Tau Beta Pi, National Engineering Honors Society, 2006-2007
- Judge - FIRST robotics competition, 2007

Updated: Fall 2017