#### Lindsey B. Bass

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#### Education

*Virginia Polytechnic Institute and State University*

Ph.D. candidate, Mechanical Engineering, expected graduation: May 2023

B.S., Mechanical Engineering, 2017

* Magna Cum Laude
* Honors Baccalaureate Diploma

B.A., Music: Vocal Performance, 2017

* Magna Cum Laude
* Honors Scholar Diploma

#### Work Experience

*National Institute of Standards and Technology (NIST)*

Pathways Intern, Engineering Laboratory: Intelligent Systems Division (Dec 2015-present)

* Interpreted data sets from multiple studies of residual stress in nickel alloy 625 manufactured with laser-based powder bed fusion
* Used laser interferometry for precision measurement of a binder jetting process
* Assisted with the design and manufacture of custom parts to hold optical equipment that will be used for in-situ part monitoring in the laser-based powder bed fusion process

Summer Undergraduate Research Fellow (May-Aug 2013, 2015)

* Designed and executed an experiment to quantify residual stress in nickel laser-based powder bed fusion parts of different geometries
* Interacted with researchers in other NIST labs for project collaboration
* Utilized library resources to perform a thorough literature survey
* Developed a method for process-intermittent measurement of binder jetting to foster process monitoring and feedback control methods for the powder bed fusion process

*Virginia Tech’s Design, Research, and Education for Additive Manufacturing Systems (DREAMS) Lab*

Graduate Research Assistant (August 2017-present)

* Collaborating with the Virginia Tech School of Medicine and Carilion Research Institute to use multi-material jetting to fabricate realistic structural heart models from computed tomography scans of patients
* Collaborating with the Virginia Tech Department of Chemistry to develop tissue-mimicking materials to be used in realistic heart models
* Characterizing the fracture energy at the interface between polypropylene-like and elastomer-like material jetting polymers within a single build
* Exploring how designed multi-material interfaces can improve fracture energies, which will lead to designing to maximize the interfacial strength between polymers with dissimilar properties

Undergraduate Researcher (June 2014-May 2017)

* Contributed to the development of a first-of-its-kind multi-tool additive manufacturing system that combines binder jetting, material jetting, vat photopolymerization, and multiple extrusion technologies on one platform to expand additive multi-material capabilities
* Performed tensile tests and characterized material properties of multiple rigid and flexible material jetting polymers under various orientation and aging conditions
* Designed and material jetted multi-material samples used to study the interface between adjacent regions of rigid and flexible polymers
* Determined process parameters to print a carbon-based material via binder jetting
* Maintained active involvement in lab outreach events by providing lab tours and interacting with the public at campus-wide science events

#### Awards and Recognitions

* National Science Foundation Graduate Research Fellowship Program Recipient (2018)
* New Horizon Graduate Scholar (2017)
* George H. and Gladys H. Cunningham Scholarship (2017)
* 2nd Place in the American Society of Mechanical Engineers (ASME) Student Manufacturing Design Competition (2017)

Represented senior design team at the Manufacturing Science and Engineering Conference at the University of Southern California, Los Angeles, CA

* National Science Foundation Graduate Research Fellowship Program Honorable Mention (2017)
* Glen Salmon Scholarship for Multidisciplinary Studies (2016)

First ever recipient; article published in the Virginia Tech News, July 2016

* Virginia Tech finalist for the Barry M. Goldwater Scholarship (2016)
* Best Poster Presentation at the Solid Freeform Fabrication Symposium (2015)

Selected from 33 poster presentations

* Finalist in the Additive Manufacturing Vehicle Design Grand Challenge (2015)
* Joe D. Simmons Metrology Scholarship (2015)

Article published in *Metrologist* magazine, July 2015

#### Peer-Reviewed Publications

* **L. Bass**, J. Milner, T. Gnäupel Herold, S. Moylan, “Residual Stress in Additive Manufactured Nickel Alloy 625 Parts,” Journal of Manufacturing Science and Engineering, Vol. 140 No. 6. (2018)
* G. Wagner, **L. Bass**, D. Rau, S. Ziv, M. Wolf, D. Wolf, Y. Bai, V. Meenakshisundaram, C. Williams, “Design and Development of a Multi-Tool Additive Manufacturing System,” *International Solid Freeform Fabrication Symposium.* (2017)
* **L. Bass**, N. Meisel, and C. Williams, “Exploring Variability of Orientation and Aging Effects in Material Properties of Multi-Material Jetting Parts,” Rapid Prototyping Journal, Vol. 22 No. 5. (2016)
* **L. Bass**, N. Meisel, and C. Williams, “Exploring Variability in Material Properties of Multi-Material Jetting Parts,” *International Solid Freeform Fabrication Symposium*. (2015) (Best poster)
* I. Vu, **L. Bass**, N. Meisel, B. Orler, C. Williams, and D. Dillard, “Characterization of Multi-Material Interfaces in PolyJet Additive Manufacturing,” *International Solid Freeform Fabrication Symposium*. (2015)

#### Poster Presentations

* **L. Bass**, D. Dillard, C. Williams, “Tailored Fracture Energies at Multi-Material Interfaces of Material Jetting Parts,” *Macromolecules Innovation Institute (MII) Technical Conference and Review 2018.* Blacksburg, VA, April 16-18, 2018.
* **L. Bass**, N. Meisel, and C. Williams, “Exploring Variability in Material Properties of Multi-Material Jetting Parts,” *International Solid Freeform Fabrication Symposium*. Austin, TX, August 10-12, 2015. (Best poster)

#### Technical Skills

*Additive Manufacturing*

Direct experience with binder jetting, material jetting, and powder bed fusion systems

Familiar with extrusion and vat photopolymerization processes

*CAD*

Familiar with Autodesk Inventor and SolidWorks

Familiar with Netfabb additive manufacturing software

Exposure to Abaqus finite element analysis software