

ALEX ROSCHLI

RESEARCH STAFF
ADDITIVE MANUFACTURING

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PROFESSIONAL PROFILE

Accomplished engineer with 11+ years of experience in additive manufacturing. Developing the only software specifically designed for Large Format Additive Manufacturing (LFAM) toolpath generation.

AWARDS

2023 AMUG DINO (Distinguished Innovator & Operator)

2023 Outstanding Young Manufacturing Engineer Award from SME

2023 Thomas A. Edison Patent Award from ASME

2021 AMUG Technical Competition First Place

2017 R&D 100: Techmer Engineered Additive Manufacturing Materials (TEAMM)

ACTIVITIES

HAM Radio Technician License
Call Sign KM4OPV

Additive Manufacturing Users Group
Co-chair of Track Leader Committee

Society of Manufacturing Engineers
Member

Association of Computing Machinery
Member

EDUCATION

Master of Science - Electrical Engineering
2015 - 2016

University of Tennessee - Knoxville, TN

Thesis: Dynamic Extruder Control for Polymer Printing in Big Area Additive Manufacturing

Bachelor of Science - Electrical Engineering
2011 - 2015

University of Tennessee - Knoxville, TN

WORK HISTORY

Research Staff I May 2012-Present

Oak Ridge National Laboratory - Oak Ridge, Tennessee

- Project Manager for ORNL Slicer 2 software package
- World's First 3D Printed Car and the former World's Largest Composite 3D Printed Object
- H-Index of 14

PATENTS

Lind, Randal, et al. "Apparatus for generating and dispensing a powdered release agent." U.S. Patent No. 10,105,876. 23 Oct. 2018.

Lind, Randall F., et al. "Method for generating and dispensing a powdered release agent." U.S. Patent No. 10,780,612. 22 Sep. 2020.

Chesser, Phillip C., et al. "Polymer exhaust for eliminating extruder transients." U.S. Patent No. 11,097,473. 24 Aug. 2021.

Post, Brian K., et al. "Cable-driven additive manufacturing system." U.S. Patent No. 11,230,032. 25 Jan. 2022.

Seokpum, K. I. M., et al. "System and method for additive manufacturing with toolpath bridges and resultant structure." U.S. Patent No. 11,534,977. 27 Dec. 2022.

Borish, Michael C., et al. "Continuous toolpaths for additive manufacturing." U.S. Patent No. 11,630,439. 18 Apr. 2023.

SELECT PUBLICATIONS

2023 Roschli, Alex C., et al. Motion and Path Planning for Additive Manufacturing. ELSEVIER, 2023.

2021 Distributed manufacturing: A case study in additive manufacturing face masks for the COVID-19 pandemic Additive Manufacturing Letters (ISSN: 2772-3690) Vol 1

2020 Real-time defect correction in large-scale polymer additive manufacturing via thermal imaging and laser profilometer Procedia Manufacturing (ISSN: 2351-9789) Vol 48

2019 Extrusion control for high quality printing on Big Area Additive Manufacturing (BAAM) systems Additive Manufacturing (ISSN: 2214-8604) Vol 28

2018 Designing for Big Area Additive Manufacturing 2018 Additive Manufacturing (ISSN: 2214-8604) Vol 25


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Roschli, Alex. “Dynamic Extruder Control for Polymer Printing in Big Area Additive Manufacturing.” Master's Thesis, University of Tennessee, 2016.

Post, Brian, and Alex Roschli. “Wide and High Additive Manufacturing.” ORNL Report, vol. ORNL/TM-20, 2017.

Roschli, Alex, et al. “ORNL SLICER 2: A NOVEL APPROACH FOR ADDITIVE MANUFACTURING TOOL PATH PLANNING.” Solid Freeform Fabrication Symposium, 2017, p. 7.

Messing, Andrew, et al. “Using Skeletons for Void Filling in Large-Scale Additive Manufacturing.” Solid Freeform Fabrication Symposium, 2017, pp. 836–43.

Love, Lonnie J., et al. “Gates Precast Concrete User Project Phase 1.” ORNL Report, vol. ORNL/TM-20, Department of Energy, 2017.

Rhyne, Breanna J., et al. “REVERSE ENGINEERING A TRANSHUMERAL PROSTHETIC DESIGN FOR ADDITIVE MANUFACTURING.” Solid Freeform Fabrication Symposium, 2017, p. 11.

Post, Brian et al. “BIG AREA ADDITIVE MANUFACTURING APPLICATION IN WIND TURBINE MOLDS.” Solid Freeform Fabrication Symposium, 2017.

Dreifus, G., et al. “Path Optimization Along Lattices in Additive Manufacturing Using the Chinese Postman Problem.” 3D Printing and Additive Manufacturing, vol. 4, no. 2, 2017, doi:10.1089/3dp.2017.0007.

Richardson, Bradley et al. “BAAM Additive Manufacturing of a Building Integrated Wind Turbine for Mass Production.” United States: N. p., 2018.

Roschli, Alex, et al. “Additive Manufacturing for Highly Efficient Window Inserts CRADA Report.” ORNL Report, vol. ORNL/TM-20, 2018.

Roschli, Alex, et al. “Precast Concrete Molds Fabricated with Big Area Additive Manufacturing.” Solid Freeform Fabrication Symposium, 2018, pp. 568–79,

Roschli, Alex, et al. “Increasing Interlaminar Strength in Large Scale Additive Manufacturing.” Solid Freeform Fabrication Proceedings, vol. 29, 2018, p. TBD.

Duty, Chad, et al. “Z-Pinning Approach for Reducing Mechanical Anisotropy of 3D Printed Parts .” Solid Freeform Fabrication Symposium (SFF Symposium 2018) , BT-Pro, 2018, pp. 2405–12.

Chesser, Phillip C., et al. “Using Post-Tensioning in Large Scale Additive Parts for Load Bearing Structures.” Solid Freeform Fabrication Symposium, 2018, pp. 556–67.

Chesser, Phillip C., et al. “Fieldable Platform for Large-Scale Deposition of Concrete Structures.” Solid Freeform Fabrication Symposium, 2018, pp. 2020–32.

Boulger, Alex M., et al. “Pick-and-Place Robotic Actuator for Big Area Additive Manufacturing.” Solid Freeform Fabrication Symposium, 2018, pp. 2151–60.

Roschli, Alex, et al. “Designing for Big Area Additive Manufacturing.” Additive Manufacturing, vol. 25, no. n/a, 2018, pp. 275–85, doi:10.1016/j.addma.2018.11.006.

Post, B. K., et al. “Using Big Area Additive Manufacturing to Directly Manufacture a Boat Hull Mould.” Virtual and Physical Prototyping, 2018, doi:10.1080/17452759.2018.1532798.

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Lindahl, John, et al. "Large-Scale Additive Manufacturing with Reactive Polymers." CAMX Conference Proceedings, vol. TP18, 2018, pp. 679–86.

Roschli, Alex, et al. "Pellet to Part Manufacturing System for CNCs." ORNL Report, vol. ORNL/TM-20, Oak Ridge National Laboratory, 2018.

Love, Lonnie, et al. "Explore the Techno-Economic Viability of Using Large-Scale Additive Manufacturing (AM) For High-Performance Windows." ORNL Report, vol. ORNL/TM-20, Oak Ridge National Laboratory, 2018.

Borish, Michael, et al. "In-Situ Thermal Imaging for Single Layer Build Time Alteration in Large-Scale Polymer Additive Manufacturing." North American Manufacturing Research Conference, BT-, vol. 34, no. 1, 2019, pp. 482–88, doi:10.1016/j.promfg.2019.06.202.

Chesser, Phillip, et al. "Extrusion Control for High Quality Printing on Big Area Additive Manufacturing (Baam) Systems." Additive Manufacturing, BT-, vol. 28, 2019, pp. 445–55, doi:10.1016/j.addma.2019.05.020.

Roschli, Alex, et al. "Design for Slicing in Large Format Fused Filament Fabrication." The Composites and Advanced Materials Expo (CAMX 2019) , BT-201, vol. TP19, 2019, p. 625-636.

Borish, Michael, et al. "In-Situ Thermal Imaging for Single Layer Build Time Alteration in Large-Scale Polymer Additive Manufacturing." North American Manufacturing Research Conference, BT-, vol. 34, no. 1, 2019, pp. 482–88, doi:10.1016/j.promfg.2019.06.202.

Borish, M., et al. "Defect Identification and Mitigation Via Visual Inspection in Large-Scale Additive Manufacturing." JOM, 2018, doi:10.1007/s11837-018-3220-6.

Gibson, Brian, et al. "MELT POOL MONITORING FOR CONTROL AND DATA ANALYTICS IN LARGE-SCALE METAL ADDITIVE MANUFACTURING ." International Solid Freeform Fabrication Symposium (SFF 2019) , 2019 BT, 2019, pp. 1–19.

Atkins, Celeste, et al. "Wire Co-Extrusion with Big Area Additive Manufacturing ." Solid Freeform Fabrication Symposium , BT-Sol, 2019, pp. 1549–57.

Roschli, Alex, et al. "CREATING TOOLPATHS WITHOUT STARTS AND STOPS FOR EXTRUSION-BASED SYSTEMS ." Solid Freeform Fabrication , BT-Pro, vol. 30, no. 0, 2019, pp. 1113–25.

Love, Lonnie, et al. "Feasibility of Using BAAM for Mold Inserts for the Precast Concrete Industry ." ORNL Report , BT-, vol. ORNL/TM-20, 2019.

Love, Lonnie, et al. "Big Area Additive Manufacturing Engineering Development, Process Trials, and Composite Core Fabrication ." ORNL Report , BT-, vol. ORNL/TM-20, 2019.

Post, Brian, et al. "On-Site Manufacture of Large Cement Structures ." ORNL Report , BT-, vol. ORNL/TM-20, 2019.

Hershey, Christopher, et al. "Large-Scale Reactive Extrusion Deposition of Sparse Infill Structures with Solid Perimeters ." The Composites and Advanced Materials Expo (CAMX 2019) , BT-201, vol. TP19, 2019, p. 742.

Chesser, Phillip, et al. "SkyBAAM Large-Scale Fieldable Deposition Platform System Architecture ." 30th Annual International Solid Freeform Fabrication Symposium - An Additive Manufacturing Conference , BT-Pro, 2019, pp. 1558–67.

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Nycz, Andrzej, et al. "Development and Demonstration of Large Scale Metal Additive Manufacturing for Military Vehicle Applications - Final Report ." ORNL Report , BT-, vol. ORNL/TM-20, 2017.

Post, Brian, et al. "Additive Manufacturing of Polyurethane Foam Mold Tooling ." ORNL Report , BT-, vol. ORNL/TM-20, 2019.

Love, Lonnie, et al. "Evaluation of Strangpresse Extruder on ORNL BAAM." ORNL Report, vol. ORNL/TM-20, 2019.

Love, Lonnie, et al. "Commercialization of Big Area Additive Manufacturing ." ORNL Report , BT-, vol. ORNL/TM-20, 2020.

Post, Brian, et al. "Large-Scale Additive Manufacturing for Low Cost Small-Scale Wind Turbine Manufacturing ." ORNL Report , BT-, vol. ORNL/TM-20, 2020.

Borish, Michael, et al. "Real-time Defect Correction in Large-Scale Polymer Additive Manufacturing via Thermal Imaging and Laser Profilometer." Procedia Manufacturing #48, 2020.

Post, Brian K., et al. Utility of Big Area Additive Manufacturing for Part Production for Low-Head Hydropower (CRADA NFE-18-07280 Final Report). No. ORNL/TM-2020/1745. Oak Ridge National Lab.(ORNL), Oak Ridge, TN (United States); Cadens LLC, Milwaukee, WI (United States), 2020.

Atkins, Celeste, et al. "Construction-scale concrete additive manufacturing and its application in infrastructure energy storage." ASME International Mechanical Engineering Congress and Exposition. Vol. 84485. American Society of Mechanical Engineers, 2020.

Smith, Tyler, et al. Dual material system for polymer large scale additive manufacturing. Oak Ridge National Lab. (ORNL), Oak Ridge, TN (United States), 2020.

Borish, Michael, and Alex Roschli. "ORNL Slicer 2.0: Towards a New Slicing Paradigm." 2021 International Solid Freeform Fabrication Symposium. University of Texas at Austin, 2021.

Post, Brian, et al. A Comparative Study of Direct and Indirect Additive Manufacturing Approaches for the Production of a Wind Energy Component. No. ORNL/SPR-2021/1905. Oak Ridge National Lab.(ORNL), Oak Ridge, TN (United States), 2021.

Post, Brian, et al. Assessment of Commercial Composite Power Pole Performance. No. ORNL/TM-2021/2068. Oak Ridge National Lab.(ORNL), Oak Ridge, TN (United States), 2021.

Wang, Peter L., et al. "Recent developments in filtration media and respirator technology in response to COVID-19." Mrs Bulletin 46.9 (2021): 822-831.

Billah, Kazi Md Masum, et al. "Large-scale additive manufacturing of self-heating molds." Additive Manufacturing 47 (2021): 102282.

Smith, Tyler, et al. "LARGE SCALE ADDITIVE MANUFACTURING Dual Material System for Polymer Large Scale Additive Manufacturing." SAMPE JOURNAL 57.6 (2021): 78-83.

Roschli, Alex, et al. "Distributed manufacturing: A case study in additive manufacturing face masks for the COVID-19 pandemic." Additive Manufacturing Letters 1 (2021): 100012.

West, Justin L., et al. "Rethinking production of machine tool bases: Polymer additive manufacturing and concrete." Manufacturing Letters 31 (2022): 33-35.

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Roschli, Alex, et al. Increasing Z-Strength and Testing the Capabilities of Twin Screw Extruders in Large Format Polymer Additive Manufacturing. No. ORNL/TM-2022/2514. Oak Ridge National Lab.(ORNL), Oak Ridge, TN (United States), 2022.

Atkins, Celeste, et al. "Empower Wall: Active insulation system leveraging additive manufacturing and model predictive control." Energy Conversion and Management 266 (2022): 115823.

Love, Lonnie, et al. Large Format, Large Diameter Filament Additive (FFF) Manufacturing-Phase 2. No. ORNL/TM-2022/2605. Oak Ridge National Lab.(ORNL), Oak Ridge, TN (United States), 2022.

Roschli, Alex, and Michael Borish. "Advanced Pathing for Additive Manufacturing." Proceedings of the 7th Annual ACM Symposium on Computational Fabrication. 2022.

Roschli, Alex, et al. "Build Plate Design for Extrusion-Based Additive Manufacturing." (2022).

Lee, Yousub, et al. Modelling of Microstructure Evolution in Wire-Based Laser Direct Energy Deposition with Ti-6Al-4V. Oak Ridge National Lab.(ORNL), Oak Ridge, TN (United States), 2022.

Jackson, Amiee, et al. "Additive Manufacturing Design Guidelines for Wind Industry." (2022).

Borish, Michael, and Alex Roschli. "Automated Path Planning for Wire Feeding in Large Format Polymer Additive Manufacturing." 2022 International Solid Freeform Fabrication Symposium. 2022.

MEDIA

"Obama visit spotlights sports car printed by UT engineers at ORNL," oakridgetoday.com, 1/9/2015, Online, <https://oakridgetoday.com/2015/01/09/obama-visit-spotlights-sports-car-printed-ut-engineers/>

David Goddard, "Obama Visit Spotlights Sports Car Printed by UT Engineers," mabe.utk.edu, 1/12/2015, Online, <https://mabe.utk.edu/obama-visit-spotlights-sports-car-printed-by-ut-engineers/>

"3D Printing Game Changer," youtube.com, 3/25/2015, Online, <https://www.youtube.com/watch?v=arTwVBKJTXA>

Brittany Tarwater, "3-D printed furniture in UT Chancellor's office," wvlt.tv, 8/4/2017, Online, <https://www.wvlt.tv/content/news/3-D-printed-furniture-in-UT-Chancellors-office-438616213.html>

Steve Vesey, "Youngstown is home to gigantic 3D printer", wfmj.com, 2/19/2020, Online, <https://www.wfmj.com/story/41720252/youngstown-is-home-to-gigantic-3d-printer>

Olivia Fankelstrom, "Center Street Technologies has developed a very large 3D printer," 3dprinterchat.com, 2/19/2020, <https://3dprinterchat.com/amp/center-street-technologies-has-developed-a-very-large-3d-printer/>

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