

Changxue Xu, Ph.D.

Assistant Professor, Department of Industrial, Manufacturing & Systems Engineering
Texas Tech University, Lubbock, TX 79409

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EDUCATION

Ph.D., Mechanical Engineering, Clemson University, SC *May, 2014*
M.S., Mechanical Engineering, Sichuan University, P.R. China *July, 2009*
B.S., Mechanical Engineering, Sichuan University, P.R. China *July, 2006*

PROFESSIONAL EXPERIENCE

Industrial, Manufacturing & Systems Engineering, Texas Tech University Lubbock, TX
Assistant Professor *09/2015 – Present*

Mechanical and Aerospace Engineering, University of Florida Gainesville, FL
Postdoc *06/2014 – 05/2015*

Mechanical Engineering, Clemson University Clemson, SC
Research assistant *08/2009 – 05/2014*

AWARDS AND HONORS

SME Outstanding Young Manufacturing Engineer Award *2018*
Travel Award for Solid Freeform Fabrication (SFF) conference, Clemson University *2013*
NSF CMMI student fellowship *2012*
Travel Award for 2010 ASME International Manufacturing Science and Engineering
Conference (MSEC), MSEC 2010 conference *2010*
Outstanding Graduate, Sichuan University, China *2006/2009*
National Scholarship of China *2005*
First-class Scholarship for Undergraduate Students, Sichuan University, China *2003/2004*

GRANTS

1. TTU Presidents' Collaborative Research Initiative 9/2017-9/2018 \$48,361
Title: Modeling the Human Blood-Brain Barrier Using Microfluidics and 3D Printing
Role: Co-Investigator (30%)
2. DOE 01/2017 No direct budget
Title: Clean Energy Manufacturing Innovation Institute (CEMII) for Reducing
Embodied energy and Decreasing Emissions (REMADE) in Material Manufacturing
Role: Co-PI (25%)
3. DOD 06/2018 \$174,000
Title: Instrumentation Acquisition for Research and Education in Hybrid

Manufacturing and Advanced Material Remanufacturing

Role: Co-PI (20%)

4. NSF 09/2018-08/2021 \$318,913
Title: Understanding the Printing Dynamics during Inkjetting of Cell-Laden Bioink for 3D Biomanufacturing Applications
Role: PI (100%)

SYNERGISTIC ACTIVITIES

- SME Outstanding Young Manufacturing Engineer Award
- NAMRI/SME Scientific Committee
- Editorial Board of *Biosensors and Bioelectronics Open Access*, *Ergonomics International Journal*, and *Journal of Ergonomics Research*
- Symposium Chair in ASME International Manufacturing Science and Engineering Conference
- Member of American Society of Mechanical Engineers and Society of Manufacturing Engineers

JOURNAL PAPERS

- **Xu, C.***, Zhang, Z., and Huang, Y., 2018, "Phase Diagram of Pinch-off Behaviors during Drop-on-Demand Inkjetting of Alginate Solutions," Under preparation.
- Wadnap, S., Krishnamoorthy, S., Zhang, Z.*, and **Xu, C.***, 2018, "Biofabrication of 3D Cell-Encapsulated Tubular Constructs Using Dynamic Optical Projection Stereolithography," *Journal of Materials Science: Materials in Medicine*, Submitted.
- Krishnamoorthy, S., Noorani, B., Zhang, Z.*, and **Xu, C.***, 2018, "Effects of Encapsulated Cells on the Physical-Mechanical Properties and Microstructure of Gelatin Methacrylate Hydrogels," *RSC Advances*, Submitted.
- Krishnamoorthy, S., Zhang, Z.*, and **Xu, C.***, 2018, "Biofabrication of 3D cellular structures based on GelMA-alginate interpenetrating network hydrogel," *Journal of Biomaterials Applications*, Submitted.
- Kadry, H., Wadnap, S., Al-Hilal, T.A., **Xu, C.**, and Ahsan, F., 2018, "Digital Micromirror-based 3D-Printing Technology and Photoreactive Polymers in Fabrication of Modified-Release Tablets," *European Journal of Pharmaceutical Sciences*, Submitted.
- Zhang, Z., Jin, Y., Yin, J., **Xu, C.**, Xiong, R., Christensen, K., Ringeisen, B.R., Chrisey, D.B., and Huang, Y., 2018, "Evaluation of Bioink Printability for Bioprinting Applications," *Applied Physics Reviews*, In press. DOI: 10.1063/1.5053979.
- Zhang, S., **Xu, C.**, Chen, J., and Jiang, J., 2018, "An Experimental Evaluation of Impact Force on a Fiber Bragg Grating-Based Device for Debris Flow Warning," *Landslides*, In press. DOI: 10.1007/s10346-018-1083-0.
- Liu, Z., Jiang, Q., Ning, F., Cong, W., **Xu, C.**, and Zhang, H., 2018, "Investigation of Energy Requirements and Environmental Performance for Additive Manufacturing Processes," *Sustainability*, Vol. 10, pp. 3606.

- Wu, D.,* and **Xu, C.***, 2018, “Predictive Modeling of Droplet Formation Processes in Inkjet-Based Bioprinting,” *Journal of Manufacturing Science and Engineering*, Vol. 140, pp. 101007.
- Kadry, H., Al-Hilal, T.A., Keshavarz, A., Alam, F., **Xu, C.**, Joy, A., and Ahsan, F., 2018, “Filament Made of HPMC, a Pharmaceutical Polymer, can be Multi-Purposed for Printing Medication with Tailored Drug Release and Timed Absorption,” *International Journal of Pharmaceutics*, Vol. 544, pp. 285-296.
- Christensen, K., Zhang, Z., **Xu, C.**, and Huang, Y., 2018, “Deformation Compensation during Buoyance-Enabled Inkjet Printing of 3D Soft Tubular Structures,” *ASME Journal of Manufacturing Science and Engineering*, Vol. 140, pp. 011011.
- **Xu, C.***, 2017, “Biofabrication of Three-Dimensional Tissue-Engineered Vascular Constructs,” *Journal of Ergonomics Research*, Vol. 1, pp. e102.
- Krishnamoorthy, S., Zhang, Z., and **Xu, C.***, 2017, “Biofabrication of Interpenetrating Polymer Network Hydrogels,” *Ergonomics International Journal*, Vol. 1, pp. 114.
- Yan, P., Brown, E., Su, Q., Li, J., **Xu, C.**, Zhou, C., and Lin, D., 2017, “3D Printing Hierarchical Silver Nanowire Aerogel with Highly Compressive Resilience and Tensile Elongation through Tunable Poisson’s Ratio,” *Small*, Vol. 13, pp. 1701756.
- Zhang, Z., **Xu, C.**, Xiong, R., Chrisey, D.B., and Huang, Y., 2017, “Effects of Living Cells on the Bioink printability during Laser printing,” *Biomicrofluidics*, Vol. 11, pp. 034120.
- **Xu, C.**, Zhang, Z., Fu, J., and Huang, Y., 2017, “Study of Pinch-off Locations during Drop-on-Demand Inkjet Printing of Viscoelastic Alginate Solutions,” *Langmuir*, Vol. 33, pp. 5037-5045.
- Zhang, M., Krishnamoorthy, S., Song, H., Zhang, Z., and **Xu, C.***, 2017, “Ligament Flow during Drop-on-Demand Inkjet Printing of Bioink Containing Living Cells,” *Journal of Applied Physics*, Vol. 121, pp. 124904.

Join Texas Tech University

- Christensen, K., **Xu, C.**, Chai, W., Zhang, Z., Fu, J., and Huang, Y., 2015, “Freeform Inkjet Printing of Cellular Structures with Bifurcations,” *Biotechnology and Bioengineering*, Vol. 112, pp. 1047-1055. **(Highlighted by the journal)**
- **Xu, C.**, Zhang, Z., Christensen, K., Huang, Y., Fu, J., and Markwald, R.R., 2014, “Freeform Vertical and Horizontal Fabrication of Alginate-Based Vascular-Like Tubular Constructs Using Inkjetting,” *ASME Journal of Manufacturing Science and Engineering*, Vol. 136, pp. 061020.
- **Xu, C.**, Huang, Y., Fu, J., and Markwald, R.R., 2014, “Electric Field-Assisted Droplet Formation Using Piezoactuation-Based Drop-on-Demand Inkjet Printing,” *Journal of Micromechanics and Microengineering*, Vol. 24, pp. 115011.
- **Xu, C.**, Zhang, M., Huang, Y., Ogale, A., Fu, J., and Markwald, R.R., 2014, “Study of Droplet Formation Process during Drop-on-Demand Inkjetting of Living Cell-Laden Bioink,” *Langmuir*, Vol. 30, pp. 9130-9138. **(Highlighted by American Chemical Society News Service Weekly PressPac and covered by R&D Magazine, ScienceDaily, MED Device Online, Inside 3DP, Transplant Families, etc.)**

- **Xu, C.**, Christensen, K., Zhang, Z., Huang, Y., Fu, J., and Markwald, R.R., 2013, “Predictive Compensation-Enabled Horizontal Inkjet Printing of Alginate Tubular Constructs,” *Manufacturing Letters*, Vol. 1, pp. 28-32. (**Invited**)
- **Xu, C.**, Chai, W., Huang, Y., and Markwald, R.R., 2012, “Scaffold-Free Inkjet Printing of Three-Dimensional Zigzag Cellular Tubes,” *Biotechnology and Bioengineering*, Vol. 109, pp. 3125-3160.
- Yan, J., Huang, Y., **Xu, C.**, and Chrisey, D.B., 2012, “Effect of Fluid Properties and Laser Fluence on Jet Formation during Laser Direct Writing of Glycerol Solution,” *Journal of Applied Physics*, Vol. 112, pp. 083105.

CONFERENCE PUBLICATIONS

- Wu, D.*, **Xu, C.***, and Krishnamoorthy, S., 2018, “Predictive Modeling of Droplet Velocity and Size in Inkjet-Based Bioprinting,” 2018 ASME International Manufacturing Science and Engineering Conference, College Station, TX, accepted.
- Krishnamoorthy, S., Zhang, M., Song, H., and **Xu, C.***, 2017, “Bingham Fluid-Assisted Fabrication of 3D Vascular-Like Constructs of Interpenetrating Network Hydrogel,” 2017 ASME International Manufacturing Science and Engineering Conference, Los Angeles, CA.
- Zhang, M., Krishnamoorthy, S., Song, H., and **Xu, C.***, 2017, “Study of Living Cell Distribution during Inkjet Printing of Bioink,” 2017 ASME International Manufacturing Science and Engineering Conference, Los Angeles, CA.
- Zhang, M., and **Xu, C.***, 2016, “Ligament Flows of Exit-Pinching during Drop-on-Demand Inkjetting of Alginate Solution,” 2016 ASME International Manufacturing Science and Engineering Conference, Blacksburg, VA.
- Xiong, R., Christensen, K., **Xu, C.**, and Huang, Y., 2014, “Jet-Based 3D Printing of Biological Constructs,” Proceedings of 25th International Solid Freeform Fabrication Symposium, Austin, TX.
- **Xu, C.**, Zhang, Z., Fu, J., Huang, Y., and Markwald, R.R., 2013, “Time-Resolved Study of Droplet Formation Process during Inkjetting of Alginate Solution,” Proceedings of 24th International Solid Freeform Fabrication Symposium, Austin, TX.
- **Xu, C.**, Huang, Y., and Markwald, R.R., 2012, “Vertical and Horizontal Fabrication of Alginate-Based Vascular-Like Constructs Using Inkjetting,” Proceedings of 23rd International Solid Freeform Fabrication Symposium, Austin, TX.
- Yan, J., Gudapati, H., Huang, Y., and **Xu, C.**, 2012, “Effect of Sodium Alginate Concentration during Laser-Assisted Printing of Alginate Tubes,” Proceedings of the ASME 2012 International Symposium on Flexible Automation, St. Louis, MO.
- **Xu, C.**, Huang, Y., and Lin, Y., 2010, “Effects of Operating Conditions on Thin Film Deposition Performance in Air Atomizing Spray Pyrolysis,” 2010 ASME International Manufacturing Science and Engineering Conference, Erie, PA.

REVIEWER

ACS Applied Materials & Interfaces, ACS Langmuir, ACS Biomaterials Science &

Engineering, Scientific Report, Materials Science & Engineering C, ASME Journal of Manufacturing Science and Engineering, ASME Journal of Nanotechnology in Engineering and Medicine, Journal of Manufacturing Processes, Journal of Zhejiang University, etc.