CENTER FOR SCIENCE OF HETEROGENEOUS ADDITIVE PRINTING OF 3D MATERIALS (SHAP3D)

INNOVATION PARTNERSHIP BUILDING AT UCONN TECH PARK

About

The Center for Science of Heterogeneous Additive Printing of 3D Materials (SHAP3D) was established in July 2018 with funding from the National Science Foundation (NSF) and the founding members from industry and national laboratories. It is a named NSF industry/university cooperative research center (I/UCRC). A collaboration between the University of Connecticut, the University of Massachusetts, and the Georgia Institute of Technology, the center is dedicated to developing critical insight into the fundamental structure-processing-property relationships to predict and control the integration of diverse materials for 3D printing.

Areas of Expertise

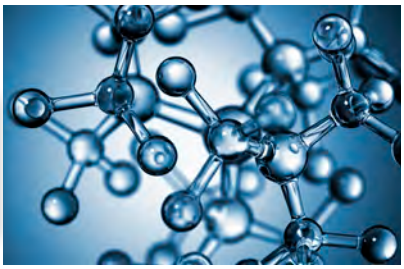
More than 50 faculty members from three universities are affiliated with SHAP3D.

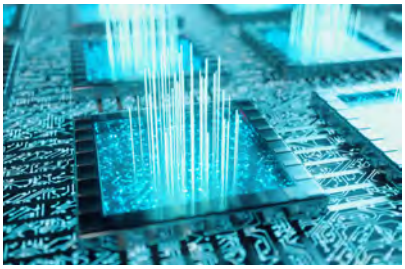
DESIGN

Achieve unique properties using multiple materials

Develop novel and enhanced materials for additive manufacturing

MATERIALS



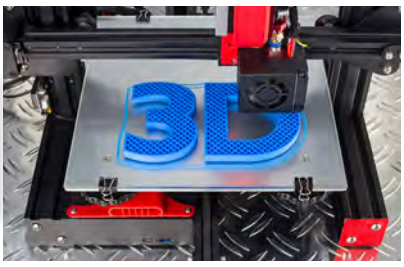


MODELING

Formulate and validate models for additive manufacturing

Improve existing processes and create new concepts

PRINTING METHODS



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Center Characteristics

Overview

SHAP3D applies innovations from research universities to develop high-impact solutions to key challenges in additive manufacturing. It provides a platform in which companies and public agencies may cost-effectively collaborate on shared, pre-competitive research topics by leveraging R&D investment to access world class facilities, faculty and graduate students. SHAP3D's goal is to decrease cost and increase reliability at all stages of additive manufacturing.

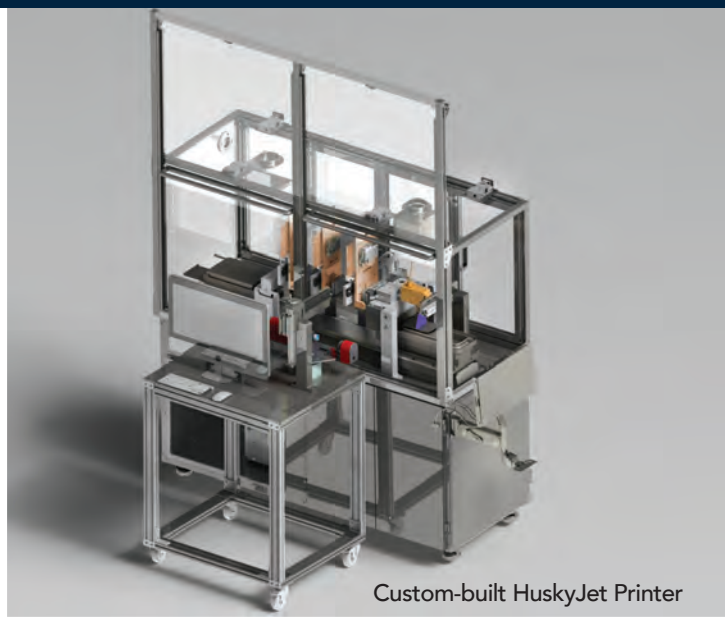
Key Instrumentation

- Pilot-Scale HuskyJet Printer
  Custom-built inkjet printer equipped with three industrial print heads, in-line UV and IR lamps, and drop imaging. This printer is capable of printing passive circuit elements, flexible electronics, food, and pre-sintered ceramic and metal parts
- Multi-material Digital Light Processing (DLP) Printer
  Custom-built printer capable of multi-material printing with high precision
- 3D Systems CJP 660 Pro Printer
  Inkjet-based printer capable of printing food, drug tablets, and pre-sintered ceramic and metal parts

Through the center, UConn faculty members also gain access to other complementary facilities at UMass Lowell and Georgia Tech to pursue collaborative projects.

Current Members

- The Boeing Company
- Desktop Metal
- HP
- Hutchinson
- Integrity
- Sandia National Lab
- Stratasys
- tsi
- United Technologies Research Center
- U.S. Army Natick



Custom-built HuskyJet Printer

Projects Recently Funded by SHAP3D

- Characterization and Process Monitoring of Selective Laser Sintering for Reclaimed High-Temperature-Resistant Polymers
- Conducting Polymer Blends for 3D Printing
- Connecting Multi-material Topology Optimization and Additive Manufacturing to Achieve Structures with Unique Properties
- Development of Performance Prediction and Design Methods for 3D Printed Parts under Uncertainty
- Fused Deposition Manufacturing of Multiple Materials
- Investigation of State of the Art of 3D Printing
- Machine Learning Enabled In-Process Defect Detection
- Methods to Evaluate Residual Stress in 3D Printed Parts
- Multi-material Projection Microstereolithography (PmSL)-based 3D Printing
- Printing of Thermoset Elastomer Compounds
- Pilot-Scale Binder Jetting for Printing Food and Polymer Parts
- Simulation-based Design for 3D Printing of Shape Changing Components

Contact

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