ABHINIT SATI

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RESEARCH INTERESTS

- Inverse Design and Physics-based Optimization for Manufacturing
- Computational Fabrication, Geometry Processing and Physics-based Simulation

EDUCATION

- PhD, Computer Science, Boston University, 2021–present (expected June 2027)
- MS, Computer Science, Clemson University, 2019–2021, GPA 3.7/4.0
- BS, Computer Science, University of Mumbai, 2016–2019, CGPA 8.2/10.0

RESEARCH EXPERIENCE

Graduate Research Assistant — **Boston University**
Advised by Dr. Emily Whiting; co-advised by Dr. Edward Chien — *September 2021 to present*

- **Fluidic shaping.** Developed a segmentation algorithm to produce sparse 3D printed scaffolds, such that when liquid polymer is injected into the submerged scaffold, interfacial tension shapes it into the approximate target geometry upon curing. Structures come out with $\approx 1\ \mathrm{nm}$ surface smoothness (in collaboration with Dr. Valeri Frumkin's group at BU).
- **Fabric formwork.** Developed a physics aware mesh segmentation method for designing sewn fabric molds. The mold pieces are computed such that local membrane stretching under loading of plaster/concrete aligns with fiber and seam directions. This reduces twisting and shearing of the fabric and produces casts closer to the target geometry.
- **Topology-optimized reinforced concrete.** Used the fabric formwork method to build low-cost, topology-optimized reinforced concrete beams (in collaboration with Dr. Josephine Carstensen's group at MIT).

Graduate Research Assistant — **Clemson University**
Advised by Dr. Victor Zordan and Dr. Ioannis Karamouzas — *January 2020 to May 2021*

- **Inverse Design.** Developed algorithms to simulate and predict cloth behavior given initial loading conditions. Implemented an inverse-design optimization scheme to efficiently find designs that produce desired performance.
- **Planning algorithms.** Developed stitch-planning techniques to alter the tensile properties of fabric, including path planning for directional stitch control that produces anisotropic material behavior within the limits of embroidery machines.

PUBLICATIONS

Peer-reviewed

- **Abhinit Sati**, Tiffany Bao, Jeff Tedi, Edward Chien, Emily Whiting. "Strain-Field Based Segmentation for Fabric Formwork." *Computer Graphics Forum* (Proc. Eurographics 2026), 45(2), 2026. doi:10.1111/cgf.70367
- Mark Hellrich, **Abhinit Sati**, Jackson L. Jewett, Edward Chien, Emily Whiting, Josephine V. Carstensen. "Affordable Construction of Topology Optimized Reinforced Concrete Through Fabric Formwork." Journal of Building Engineering, 2026. 10.1016/j.jobe.2026.117472
- **Abhinit Sati**, Ioannis Karamouzas, Victor Zordan. "DIGISEW: Anisotropic Stitching for Variable Stretch in Textiles." *Symposium on Computational Fabrication (SCF)*, 2021. doi:10.1145/3485114.3485121

Preprints

- **Abhinit Sati**, Jacob Garrett, Valeri Frumkin, Edward Chien, Emily Whiting. "Piecewise CMC Segmentation for Fluidic Shaping." arXiv:2611.00227, 2026. arxiv.org/pdf/2611.00227
- Jacob Garrett, **Abhinit Sati**, Edward Chien, Emily Whiting, Valeri Frumkin. "Manufacturing Complex Structures Through Interfacial Self-Organization." Preprint forthcoming, arXiv, 2026.

Master's Thesis

- **Abhinit Sati**. *A System for Programming Anisotropic Physical Behaviour in Cloth Fabric.* MS thesis, Clemson University, 2021. tigerprints.clemson.edu/all_theses/3621

INVITED TALKS

- School of Computing Seminar, Clemson University.

AWARDS

- Graduate Scholarship, Clemson University: fully funded Research Assistantship for the final academic year.
- Runner-up, Best Virtual Reality Project (course project; instructor Dr. Sabarish Babu): an immersive 3D application for visualizing molecular orientation and bond formation to aid learning of chemistry students.