

LOOM3D Weaves a New Future for Sustainable Apparel Through DMCSP Pre-Accelerator Support

What if clothing could be made without cutting, sewing, and wasting yards of fabric? For founder Jeanine Fry, that question sparked an innovation journey that is now reshaping how garments may one day be manufactured.

Through support from the North Carolina Defense Manufacturing Community Support Program (DMCSP) and guidance from entrepreneur mentor Emil Runge, starting during his time at the First Flight Venture Center's Propeller pre-accelerator program.

Raleigh-based startup LOOM3D is advancing a groundbreaking textile technology that could dramatically reduce apparel waste while creating new manufacturing opportunities.

From Industry Frustration to Innovation

Jeanine's path to entrepreneurship began in the apparel industry, where she saw firsthand the amount of material waste generated through traditional garment manufacturing. "I worked in the apparel industry and saw a lot of waste piling up around me," she said. "I did not want to participate and add to that."

After working in custom suiting, where garments were only produced on demand, Jeanine became increasingly convinced there had to be a better way to manufacture clothing—one that reduced excess production and material waste. That search for answers led her to weaving technology and eventually to North Carolina.





After discovering the renowned textile resources at NC State University's Wilson College of Textiles, Jeanine relocated from Chicago to pursue graduate research at the intersection of apparel design and textile engineering. What began as an idea quickly evolved into a vision for transforming garment manufacturing.

Reimagining Apparel Production

Today, LOOM3D is developing technology that enables three-dimensional garments to be woven directly on standard weaving machines—eliminating many of the steps associated with conventional apparel manufacturing. Instead of producing flat fabric that must be cut and sewn together, LOOM3D creates garment structures directly from yarn. "LOOM3D takes weaving machines and weaves three-dimensional structures on the loom so that you're going from yarn directly to a fully assembled garment," Jeanine explained.

The company's innovation goes beyond existing seamless textile approaches. While woven tubes and seamless dresses have been explored historically, LOOM3D has developed a method for weaving bifurcated garments—such as pants—in a single production process. "We have developed a process that allows us to weave a pant-like structure in one go on the loom," she said. "You take it off, and it's kind of like origami." The result is a manufacturing approach with the potential to reduce textile waste, simplify production, and create more efficient pathways for custom or advanced apparel manufacturing.

DMCSP Opens the Door to Commercialization

As Jeanine's research advanced, she recognized that technological innovation alone would not bring the idea to market. She needed to understand commercialization, business strategy, and how to communicate the opportunity to industry partners and investors. That is where DMCSP support and Emil Runge entered the picture.

After participating in entrepreneurship programming through NC State and receiving an NC IDEA micro grant, Jeanine met Emil during a mentor session. Recognizing the promise of LOOM3D, he encouraged her to join a textiles-focused Propeller pre-accelerator cohort supported through DMCSP. The timing proved transformative. "When the NC IDEA programming ended, I started doing the Propeller programming," Jeanine said. "That was really nice because they offer different things with their programming."

Through the program, LOOM3D gained structured guidance to refine its business strategy, strengthen its

messaging, and build a compelling commercialization pathway. A major focus of the pre-accelerator experience was helping Jeanine transform a technical research concept into a clear, investor-ready business. “We spent a good amount of time developing resources for the pitch deck,” she said. “I was really able to level up the pitch deck.”

The process helped LOOM3D move beyond technology development and begin shaping a recognizable brand identity, competitive positioning, and commercialization strategy. “We started getting more on brand—building the brand concept for the company—but then also figuring out how to use that to communicate as well,” she said.

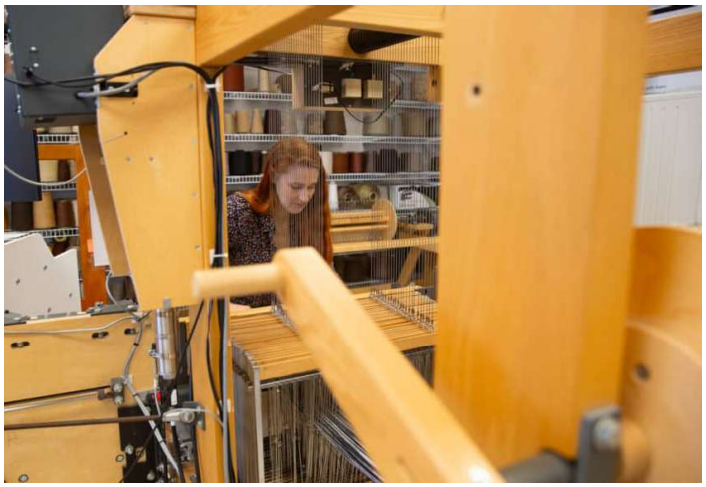
Building Confidence, Community, and Industry Connections

According to Jeanine, one of the greatest benefits of the DMCSP program and the Propeller pre-accelerator was access to a community of fellow founders, mentors, and industry connections. Participants worked collaboratively, exchanged feedback, and helped refine one another’s ideas from different perspectives. “You get to go on a journey,” she said. “You really can see it evolve and flesh out, bring it into a cohesive vision.”

The program also helped LOOM3D gain exposure to potential industry stakeholders and business opportunities through networking and demo events. Most importantly, Jeanine credits Emil Runge’s mentorship with helping move the company forward. “Emil was very, very helpful with bringing that vision into fruition,” she said. “He’s absolutely amazing. He’s a great cheerleader. He’s wonderful. He’s brilliant.”

Momentum for What Comes Next

Today, LOOM3D is no longer simply a research concept. The company is actively engaging with industry leaders who are taking the technology seriously as a scalable manufacturing solution. “We’re having conversations with industry, and they are taking this seriously as a potential manufacturing solution,” Jeanine said.

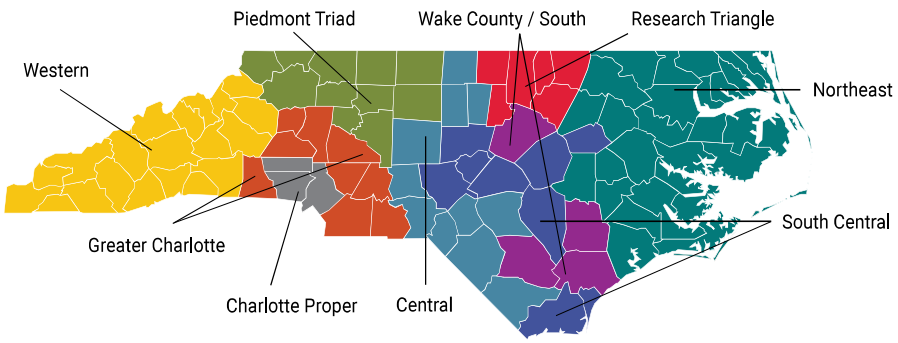


As she completes her Ph.D. at NC State University, Jeanine is preparing to transition into working on LOOM3D full-time. Having recently secured DoW funding to support continued development, the company now has additional runway to advance its technology and commercialization efforts. For Jeanine, the goal has always been bigger than creating a company. It has been about rethinking how apparel gets made.

Thanks to support from DMCSP and Emil Runge’s mentorship through the Propeller pre-accelerator program, LOOM3D is moving closer to turning that vision into reality—one woven innovation at a time.

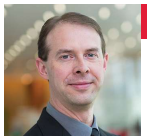


NC State University Industry Expansion Solutions Regional Managers Serve All 100 Counties in North Carolina.





Western
Chris McGraw
828.329.3119
chris_mcgraw@ncsu.edu



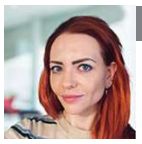
Research Triangle
Mitch Poteat
919.607.0684
mitch_poteat@ncsu.edu



Piedmont Triad
Kami Baggett
919.830.7292
kameron_baggett@ncsu.edu



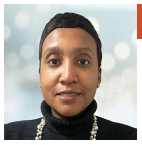
Wake County
Robert Crew
919.830.2941
robert_crew@ncsu.edu



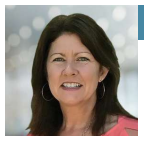
Charlotte Proper
Jennifer Fielder
704.380.0063
jennifer_fielder@ncsu.edu



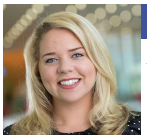
Northeast
Lori Benn
919.988.7475
lori_benn@ncsu.edu



Greater Charlotte
Tamara Mack
980.281.0939
tamara_mack@ncsu.edu



Central
Mary Tillery
910.622.5849
mary_tillery@ncsu.edu



South Central
Anna Mangum
919.210.6050
anna_mangum@ncsu.edu

Contact the IES Regional Manager in your area.
ncstateies.com/RM

We Can Help.

- Advanced Manufacturing & Technology Deployment
- Business Growth, Innovation & Marketing
- Business & Operational Assessments
- Cybersecurity Strategies
- Defense Industry Initiatives
- Environment, Energy & Sustainability Services
- Evaluation Services & Resource Development
- Industrial & Systems Engineering
- Instructional Design
- Leadership & Organizational Development
- Management Systems & Quality
- Process Optimization & LEAN
- Project Management
- Southeastern OSHA Training Institute Education Center
- Supply Chain & Supplier Matching
- Workplace Health & Safety

NC STATE UNIVERSITY Industry Extension Services

We Can Help. **919.515.2358 | iesservices@ncsu.edu**

NC State University Industry Extension Services, established in 1955 as the outreach team for the NC State University College of Engineering, provides resources, tools and customized training programs to help businesses survive, thrive and grow.

ies.ncsu.edu **@NCStateIES**

09-17-2026