

WWD

FIT, MIT Students Create 3-D Knitting Concepts

The initiative brought resources and talents from both institutions together.

By [Lauren Olsen](#) on June 26, 2018



Courtesy of FIT

Students at [Fashion Institute of Technology](#) and [Massachusetts Institute of Technology](#) recently teamed up to create product concepts exploring the use of advanced fibers and [technology](#). Three students from each school were selected to join the program.

The initiative was in collaboration with non-profit, Advanced Functional Fabrics of America. The student participants also developed marketing strategies to accompany the projects.

“This workshop validates the benefits of bringing [FIT](#) and MIT students together. For this specific workshop, they explored the possibilities of advanced knitting and 3-D printing,” said Joanne Arbuckle, deputy to the president for industry partnerships at FIT. “As the fashion

industry becomes more and more dependent on advanced textiles, students who have the experience this workshop has provided will prove to be the industry's next leaders."

Over two weeks, the students visited both campuses and participated in workshops, learning sessions, mentoring sessions. The students held presentations at FIT's campus last week to showcase their completed projects. Among concepts demonstrated: an item that — by adjusting the straps — could be worn as a long dress or apron and a color changing garment.

Environmental sustainability appeared to be a priority for these students, suggesting the next generation of designers will be focused on eco-friendly materials and production.

Reflecting upon their experiences, the students said the focus on entrepreneurship and inspiration were main benefits and draws. The students also said the capability to maximize on the strengths and resources of the academic institutions were highlights, too.

Veronica Aspan, an FIT graduate and fashion design major with a specialization in knitwear, said that the schools' partnership signaled the importance of collaboration within the industry: "Putting together our talents is truly the future."

MIT News

ON CAMPUS AND AROUND THE WORLD



Advanced Fiber workshop participants compare the differences between weft knit and warp knit for sweater construction at FIT in New York City. Pictured (clockwise from left) are Veronica Apsan, Melanie Wong, Jesse Doherty, Erika Anderson, Sebastian Pattinson, David Merchan, and Calvin Zhong.

Photo: Smiljana Peros

Inventing future fabrics

Advanced Functional Fabrics of America workshop challenges pioneering MIT and FIT students to conceive new ideas.

Materials Research Laboratory

July 31, 2018

A T-shirt that can change color to complement your mood (and help you pare down your wardrobe). An apron that transforms into a dress and has interchangeable pockets with high-tech functionality. These are the forward-looking concepts presented by a group of three students from MIT and three students from the Fashion Institute of Technology (FIT), making practical use of the latest active textile technologies.

For the first FIT/MIT Summer Workshop, held over two weeks in June, the six students spent one week at MIT in Cambridge, Massachusetts and one week at FIT in New York City to explore and develop clothing concepts using advanced functional materials that incorporate 3-D printing or advanced knitting technologies. The workshop was held collaboratively with Advanced Functional Fabrics of America (AFFOA), a Cambridge-based national nonprofit enabling a manufacturing-based transformation of traditional fibers, yarns, and textiles into highly sophisticated integrated and networked devices and systems.

Personal identity

Veronica Apsan, of Park Ridge, New Jersey, a 2018 FIT graduate who majored in fashion design, and Erika Anderson of Carlsbad, California, a rising MIT senior who is studying mechanical engineering with a minor in design, conceived a T-shirt that can change color.

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"We were really interested in color and how it affects people's moods and how they feel," said Anderson. "Color and clothing are part of a person's identity and how they want to portray that to the world." Anderson and Apsan started with a color-changing filament that they 3D-printed into modular components. From there, they moved on to hollow fibers that can be filled with an ink that changes color when an electrical current is sent through it.

"Many people own basic clothing or similar shirts and pants in different colors," Anderson explained. "This takes up a lot of closet space and costs a lot of money." A large wardrobe is also not environmentally friendly. With a T-shirt that can change color, a person could radically pare down how many garments they buy and throw out.

The four other students in the workshop combined their ideas into a single wearable concept. David Merchan, of Bow, New Hampshire, a rising MIT senior double majoring in materials science and engineering and physics; Melanie Wong of Queens, New York, a rising senior at FIT majoring in fashion design; Calvin Zhong '18, of Manhattan, a recent MIT graduate who double majored in architecture and comparative media studies; and Jesse Doherty, an FIT rising senior majoring in fashion design, created a double-layer knit laboratory apron with reflective zippers that transforms into a dress or bag and has interchangeable pockets with customizable technological functions. For example, one pocket could have an energy socket that wirelessly charges a phone, while another could act as a hand sanitizer by working into the fiber antimicrobial chemicals or ultraviolet LEDs. The apron/dress itself could also be infused with conductive fibers that cool or warm the wearer.

"You could imagine that a lab tech would have different needs than a doctor, who would have different needs than a DIY hobbyist or a shop manager," explained Zhong.

3-D-printed mesh

Using 3-D printing, the students knit an open, fully twistable weave mesh for their apron/dress. Once the soluble supports were removed in a chemical bath, the mesh moved in every direction because of the flexible fiber. "The same structure in different materials would behave differently," noted Doherty.

In addition to conceiving their projects, the students had a packed schedule of workshops, talks, and site visits. While at MIT, they learned about bringing their ideas to market through an intensive entrepreneurship boot camp. They also attended an AFFOA member networking event at the Institute of Contemporary Art in Boston, where Apsan said she and Anderson received positive feedback about their ideas. "The fact that someone in the industry who is working on textiles is thinking the same thing was so awesome to hear," she said. During their week at FIT, the students visited WGSN, a leading fashion trend, forecast, and analysis service, and met with Gabi Asfour, founder and creative director at threeASFOUR, a clothing design brand, about incorporating 3-D-printed parts into garments. MIT and FIT faculty mentors assisted the students throughout the two weeks.

"We believe this is the future, so we want you all to be involved and help make it happen," AFFOA Chief Executive Officer Yoel Fink told the group.

Inspiring collaboration



State grant will support advanced fiber and fabric research at Lincoln Lab



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Gregory C. Rutledge, lead principal investigator for MIT in AFFOA and the Lamot du Pont Professor in Chemical Engineering, commented, "It is exciting to see what happens when students from different fields of engineering and design, but with a common interest in advanced fibers and fabrics, come together and engage with new kinds of materials and manufacturing techniques. The collaboration and creativity is inspiring."

"Combining the talents and skills of FIT and MIT is truly the future," said Apsan as the two-week workshop wrapped up.

"This workshop validates the benefits of bringing FIT and MIT students together. For this specific workshop, the students explored the possibilities of advanced knitting and 3-D printing," said Joanne Arbuckle, deputy to the president for industry partnerships and collaborative programs at FIT. "As the fashion industry becomes more and more dependent on advanced textiles, students who have the experience this workshop has provided will prove to be the industry's next leaders."

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MIT News Office • Building 11-400
Massachusetts Institute of Technology • Cambridge, MA 02139-4307