

## Troy Startup Makes Western Hemisphere's First 3D-Printed Ceramic Facade with CEG's Support

### Overview

MetaOrnate is a Troy, New York startup that makes ceramic architectural facades via additive manufacturing, also known as 3D printing. Riley Studebaker founded the company in early 2023, following his move to the Capital Region to become a lecturer on robotic building materials at Rensselaer Polytechnic Institute's School of Architecture. MetaOrnate in January 2024 will deliver the western hemisphere's first 3D-printed ceramic facade. The wall was made with a robotic arm that the Center for Economic Growth (CEG) helped bring to the Tech Valley Center of Gravity (TVCOG), a makerspace in Troy.

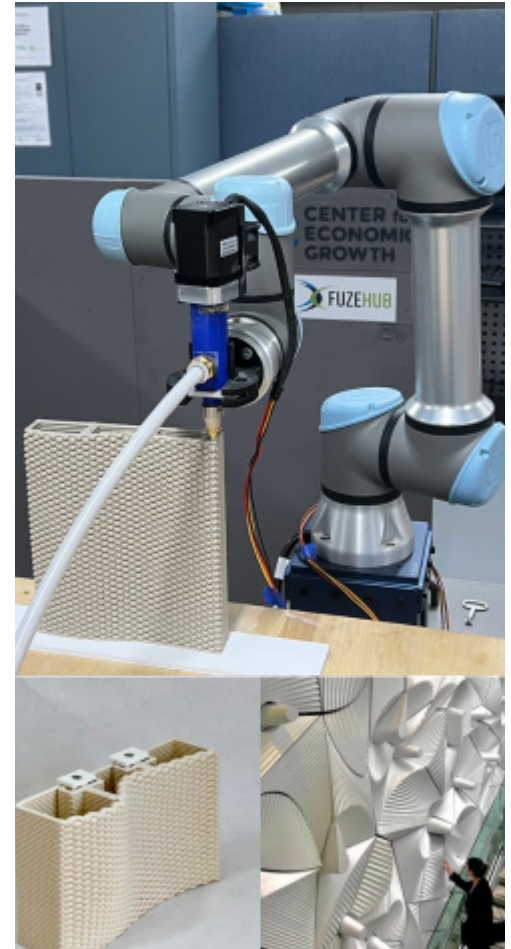
### The Situation

When Studebaker moved to the Capital Region in January 2023, he planned to start a company that designs and produces 3D-printed ceramic facades, though he was not sure how long it would take to scale the business. He had gained experience in this field at the University of Pennsylvania Weitzman School of Design, where he had received his Master of Science in design with a concentration in robotics and autonomous systems and where he later worked as a researcher. Both UPenn and RPI have the 3D printing and robotic arm equipment that Studebaker would need to produce the highly decorative ceramic facades, but gaining access to such technology for a private enterprise usually would be challenging.

### The Solution

However, gaining access to that technology was less challenging in the Capital Region. That is because the first time Studebaker walked into the TVCOG, he saw the UR5 robotic arm made by Universal Robots, and he realized his startup would get off the ground much faster than he anticipated.

The UR5 programmable robotic arm at the TVCOG has a reach of 33.5 inches (850 mm) and a payload of 11 pounds (5 kg). The device is owned by Fuzehub, a statewide Manufacturing Extension Partnership (MEP) center. CEG Director of Technical Services Tom Bell advocated for the UR5's placement at the TVCOG and worked to attract entrepreneur interest in its utilization. In early 2023, CEG entered into an agreement with Fuzehub to borrow the UR5. "This is a gem, and it makes the TVCOG stronger," Studebaker said of the UR5.



"Riley happened upon the cobot during a tour of the COG. Without access, he wouldn't have been able to validate his prototype idea and start producing product for his first customer," said TVCOG Facilities and Incubator Director Dan Falkenstrom.

In partnership with another TVCOG member, Josh Sarantitis and his startup Mural Arts Philadelphia, Studebaker used the UR5, which can 3D print in unlimited positions and orientations, to create a 500-square-foot, 3D-printed ceramic facade for a Philadelphia recreation



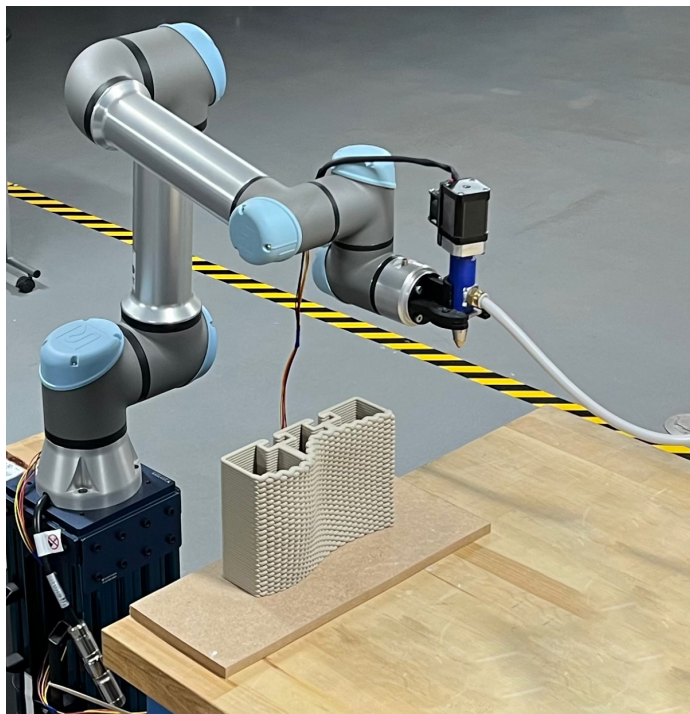
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center. When delivered in January 2024, it will be the first 3D-printed ceramic facade in the western hemisphere. The first 3D-printed ceramic facade was created by Studio RAP in the Netherlands and installed in 2020.

"This is not lean engineering. This is leveraging robotic labor for beautiful craft," said Studebaker.

When MetaOrnate begins building its payroll, each robotic arm will require one employee. While CNC operators and programmers, such as those trained at Hudson Valley Community College in Troy, have the general knowledge to operate a robotic arm, the creation of MetaOrnate's ceramic facades requires an understanding of ceramic 3D printing and the properties of clay. Those are topics Studebaker teaches at RPI.



*CEG has been central to the ability for me to establish MetaOrnate as a business, and to have our initial success. I have hired an RPI student who was previously my researcher to work on our first project: a wall that is scheduled to be delivered in Philadelphia in January 2024 using clay material extracted from Sheffield, Massachusetts and processed in Troy. The resources available to me through the CEG as well as the TVCOG and FuzeHub were a contributing factor in my decision not only to establish MetaOrnate but also to take a job offer to teach in the area at RPI. With full candor, the CEG, as well as specifically Tom Bell, have been central to the existence and success of this endeavor so far.*

**- Riley Studebaker**  
Founder, MetaOrnate

### About CEG, Business Growth Solutions

We serve small to medium sized manufacturing and technology companies (SMEs), helping them drive top and bottom-line growth. CEG BGS houses the regional Manufacturing Extension Partnership (MEP) center, which is part of the New York State MEP program funded by the National Institute of Standards and Technology (NIST) and Empire State Development Division of Science, Technology, and Innovation (NYSTAR).



To learn how CEG BGS could help your company, contact CEG BGS Senior Vice President, Don Wiesenforth at donw@ceg.org or call 518-431-1481.