

Supporting 3D Printing Design

By: Rapid Access International, Inc.

November 2022

The topic of 3D printing has come up more than once in these articles over 2022; including its use in the next generation of self-healing materials (Oct. 2022) and 3D-Printed Homes (February 2022). It's a hot trend. One recent report published by Allied Market Research projects a compound annual growth rate (GAGR) of 87.3% from 2022 to 2031 for the 3D Printing Construction Market.¹ That's about 1.4 billion in 2021 to over \$750 billion in 2031.

With this kind of growth rate, it would seem that the 3D printing trend does not need any help to take hold. But, not every architect, builder, or product designer has the time or the skill set to design, model and fabricate 3D printed parts. In order to sustain high rates of growth in this field – or even stimulate higher growth – there may be a need for specialized skills and software to support this growing demand.

Novineer

A start-up company out of Embry-Riddle Aeronautical University promises to provide exactly this kind of support. Faculty member and CEO Dr. Ali Tamijani co-founded Novineer with one of his former Ph.D. students, Dr. Zhichao Wang, who is the company's chief technical officer (CTO).

Novineer's design and simulation software can simplify and accelerate the process of designing, modeling, and fabricating high-performance 3D printed parts, according to Dr. Tamijani. He explains that designs typically taking four days to complete using current methods could be completed in no more than four hours using Novineer's software.² He expanded further on the company's vision in a recent interview:

"Our vision is to become the design hub for 3D printing," said Tamijani, adding that he and his team focus on including manufacturing constraints, material properties, and system requirements in the design process "to unlock and 'unlimit' innovation by product engineers. We don't want them to be held back by all the limitations that current software sets. Our vision is to streamline the design and simulation process for 3D printing."³

Initially an academic project, the company has transitioned to a viable business through its participation in an NSF program known as i-CORPS. Dr. Wang explained in the same interview article that "the program, which sets up interviews between engineers, business developers, and prospective customers in different industries, was really valuable because it allowed him to see what customers need.":

¹ "3D Printing Construction Market By Construction Method, By Material Type, By End-User: Global Opportunity Analysis and Industry Forecast, 2021-2031". Research and Markets. June 2022. Available at: https://www.researchandmarkets.com/reports/5671134/3d-printing-construction-market-by-construction?utm_source=BW&utm_medium=PressRelease&utm_code=8xqt86&utm_campaign=1785269+-+The+Worldwide+3D+Printing+Construction+Industry+is+Projected+to+Reach+%24750.7+Billion+by+2031&utm_elec=jamu273prd. Accessed on December 9, 2022.

² Wakefield, Edward. "Novineer aims to become 'the design hub for 3D printing'". 3D Printing Media Network. December 8, 2022. Available at: <https://www.3dprintingmedia.network/novineer-aims-to-become-the-design-hub-for-3d-printing/>. Accessed on December 9, 2022.

³ *Ibid.*

“Before, we were thinking like engineers and scientists, focused on our invention and technology. But business people are thinking, ‘I have a problem. I don’t care what your method is.’ We made contacts and learned how to focus on the customers’ needs and the values we deliver to them.”⁴

The company has now received awards from the National Science Foundation and the US Air Force Office of Scientific Research, and some initial funding has also been received. The company recently won a \$50,000 investment from a nonprofit tech startup accelerator called StarterStudio, as well as second place and an additional \$30,000 at the Florida Venture Forum Early-Stage Capital Conference in October. Tamijani and Wang have further signed an option agreement for two patent applications with Embry-Riddle.

Support from Embry-Riddle

Since October, the company has now moved to the MicaPlex facility in Embry-Riddle’s Research Park, joining the MicaPlex Technology Business Incubator. It is currently working with their pilot customers to further develop their design technology.

“Novineer is a great example of a commercialization pathway that the university strives to support”, Dr. Stephanie Miller, executive director of technology transfer and research park initiatives at Embry-Riddle.⁵ Impressively, 163 jobs paying an average annual salary of \$75,000 have been created since 2017 as a result of entrepreneurship and innovation at Embry-Riddle’s Research Park. Some 25 affiliated companies have raised \$101 million from grants and investors.

Going Forward

Supported by a potentially massive increase in demand over the next decade or more, there may be a great need for companies like Novineer to help designers, manufacturers, builders and others to lean on their specialized skills and technologies when it comes to 3D printing. It’s easy to think of 3D printing itself as an ever-advancing technology that is followed by ever-higher demand due to the promise of efficiency and flexibility. The boundaries of 3D printing hardware technology may indeed be the limiting factor. But, it will be the innovation of software developers like Novineer that will expand the possibilities in terms of its use and pervasiveness. In addition to private investment, programs like the one at Embry-Riddle and support from the likes of NSF may be a key differentiator in the US for this field.

⁴ *Ibid.*

⁵ *Ibid.*