

Dynamic tendrils and multi-colored sea creature were 3D printed on a Connex.

Limitless Possibilities

Victoria University Of Wellington Pushes Students With 3D Printing

In New Zealand, the word “tutū” means to fidget or fiddle with something allowing you to learn with your hands. For Victoria University of Wellington (VUW), 3D printing is an outstanding educational tool for tutū, helping students across many disciplines understand complex theories and prepare for the workforce.

“The industrial design profession has historically used 3D printing technology to make prototypes of products that will be mass produced using traditional mechanical engineering methods,” said Ross Stevens, program director of the university’s Industrial Design department. “As my experience with 3D printing processes grew, I became more interested in the printers’ ability to make the traditionally un-makeable. This shift led to intricate and diverse objects more derived from bio engineering than mechanical engineering.”

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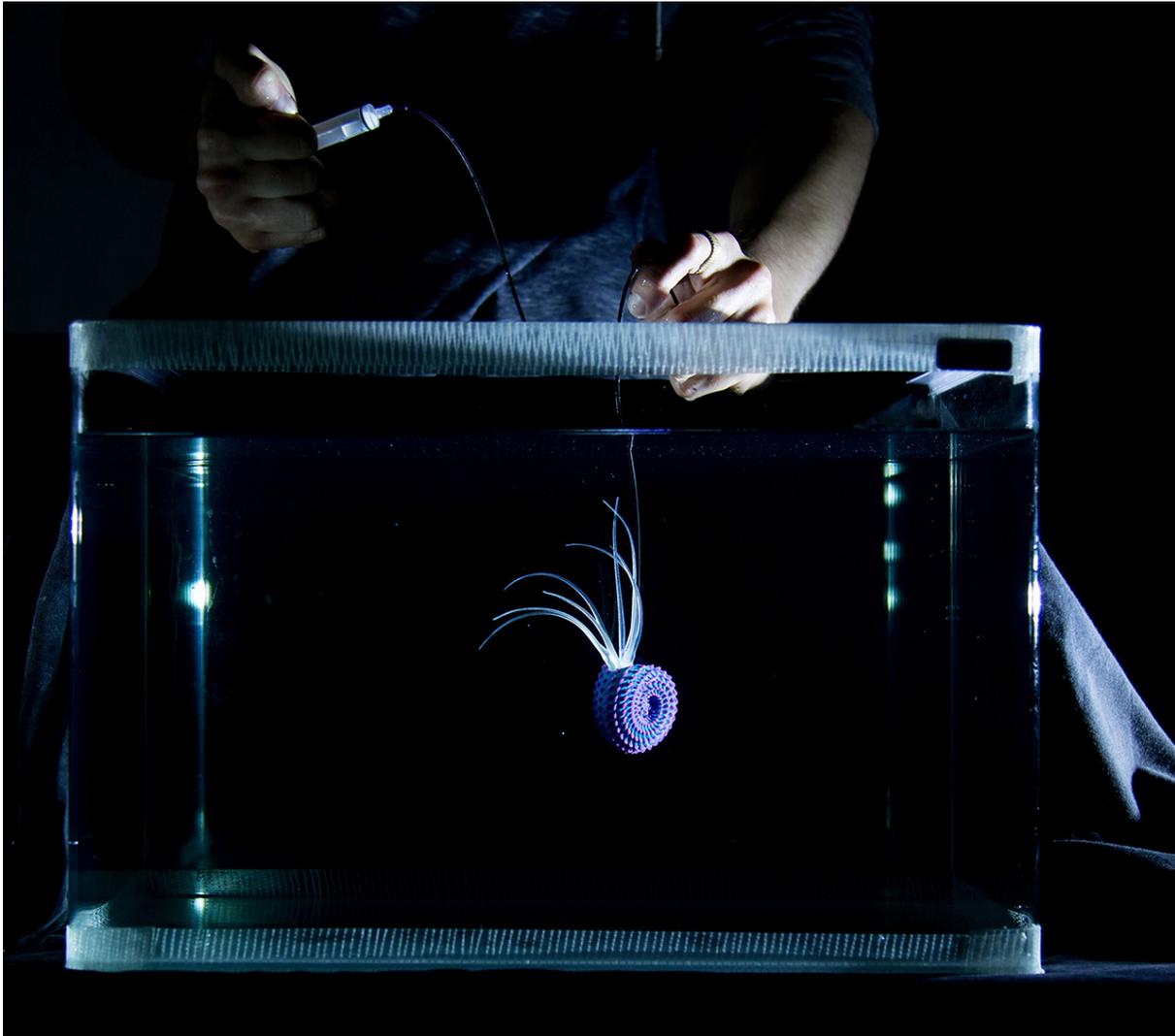
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3D printed aquatic sea creatures designed by staff and students.



Filming the 3D printed aquatic sea creature. The students attached the creatures to string to simulate underwater behavior.

Building a Future

For Stevens, who has been using Stratasys 3D printers since 2004, applied learning is downright transformational. 3D printing is a particularly important gain in a world where colleges want to attract and retain students in the STEM subjects of science, technology, engineering and math. 3D printing not only supports tutü, it reduces the time associated with production so Stevens can help more students and departments.

Stevens' FUN (Future Under Negotiation) program helps students in nonengineering disciplines prepare for the future with applied learning. Stevens uses 3D printing to help the classes build fictional scenarios using coding, rendering and multi-property 3D printing. "We

can achieve a lot with today's materials, but with emerging materials, we'll be able to do much more very soon," said Stevens. The university prefers PolyJet™ 3D printing technology from Stratasys® because it offers the multi-color, multiproperty printing the school needs.

VUW turned to 3D printing not long after the nation retracted its trade barriers and most of its production industries moved offshore. "We lost most of our mass production jobs, and as a result, our university started exploring emerging technology that would lead to new job creation," Stevens said.

Students Create Complex Details

Students at VUW have 3D printed a custom facial prosthesis that costs just \$100 to produce (versus \$1,000 for a traditional product,) shoes that use accurate 3D scanning to make a personalized pair with enhanced biomechanical performance. Students also created hi-fi speaker drivers that incorporate structurally intricate details printed in both hard and soft materials during a single printing process.

For classics professor Diana Burton, having a 2500-year-old Roman kylix bowl scanned and 3D printed was a dream come true. She can now reenact Roman drinking games with her students. Stevens' colleague Bernard Guy applied industrial design craft to both the scans and the 3D prints to create realistic qualities of weight and feel for the student festival. "The original chalice was in a glass cabinet because it was so special," says Stevens. "To some extent, the applications that aren't always obvious are among the most interesting."

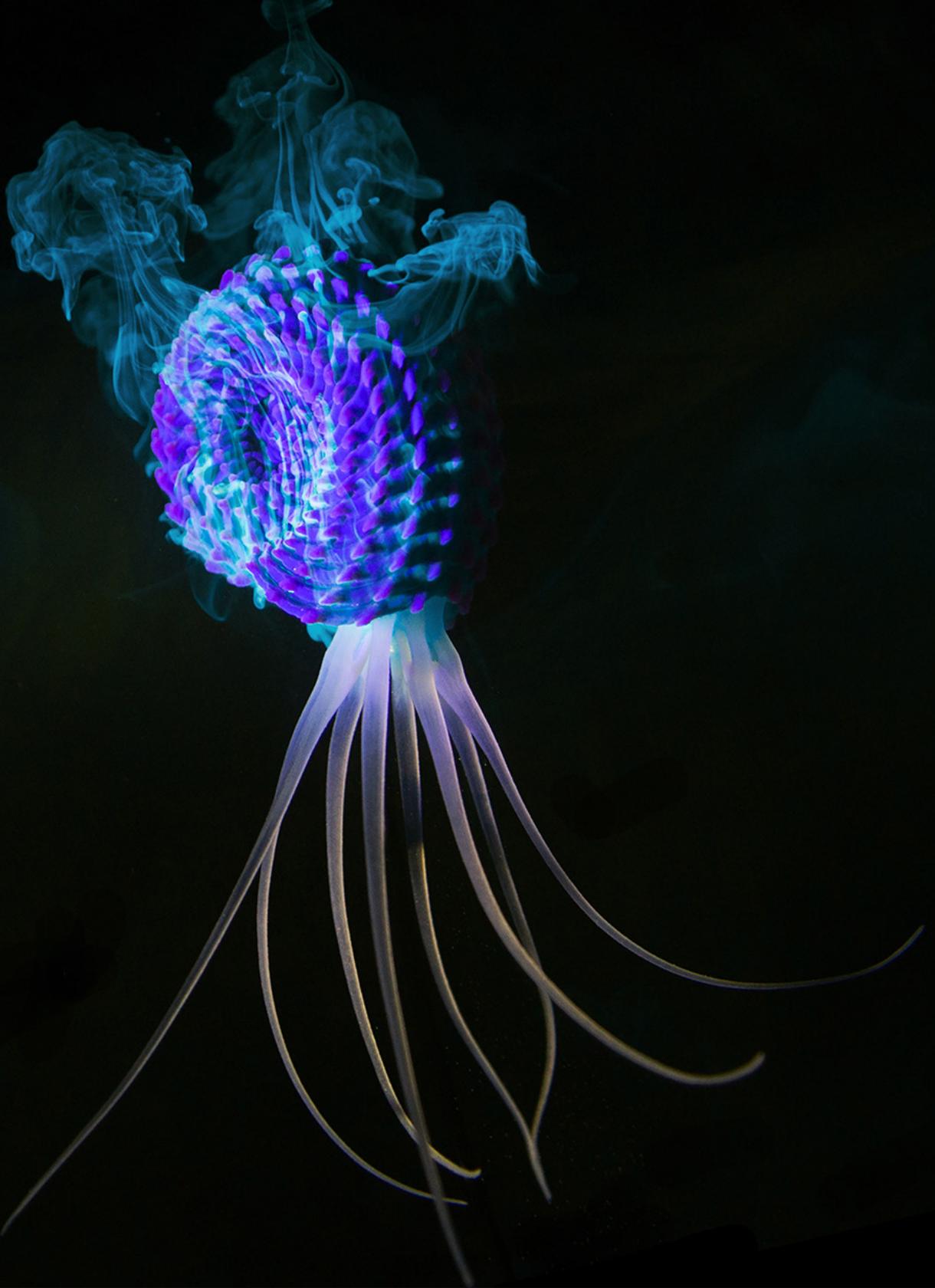
The university also works closely with Weta Workshop, a New Zealand firm that develops special effects and props for movies like "Lord of the Rings" and "Avatar." As a research project, students recently designed 3D printed aquatic creatures for use as dynamic and interactive film props. The project titled Lissom presented a more physical and realistic alternative to using computer-generated imagery in film. The 3D printed sea creatures were filmed inside a tank of water and closely mimicked the different animal behaviors.

To other schools considering 3D printing, Stevens believes the best is yet to come. "Goodness knows what Stratasys will come up with over the next few years. Is it reactive materials, bio-printing or perhaps adding an electrical current that will make the printed objects move?" Stevens said. "The possibilities are virtually limitless."



Industrial design students examine the 3D printed chalice kylix bowl replica.

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