



Bio-Inspired Robots Featured at First Maker Workshop for Veterans



Workshop attendees, Juan Cortez (left) and Davis Takhvar, both Navy veterans, plan to continue their interest in robotics this fall as freshman majoring in mechanical engineering technology and electrical engineering, respectively.

By Keith Pierce (<mailto:kpierce@odu.edu>)

Walking, flapping, swimming and running are things animals do every day. Most of us don't think about it. However, for decades those movements have inspired engineers and scientists seeking to improve technology.

In a recent workshop at Old Dominion University, veterans applied 3D printing techniques to build robots that mimic some of these animal movements.

"Nature offers examples of animals and insects with distinct morphological and biomechanical traits that enable them to reliably adapt and navigate in a wide range of unstructured terrains," says Krishnanand Kaipa, an assistant professor of mechanical and aerospace engineering and director of the Collaborative Robotics and Adaptive Machines Laboratory.

Bio-inspired robotics involves the design and production of materials and structures inspired by natural systems such as insects, birds, mammals and reptiles. Because each animal has a unique mechanical design, engineers and scientists have long believed that bio-inspired robotics offers the potential to enhance capabilities in manufacturing, health care, search and rescue, and more.

Made possible by a grant from the National Science Foundation (NSF), the workshop aimed to understand the impact of "making" for veterans pursuing STEM degrees. Maker education is hands-on learning that leverages the natural human instinct to create. Anthony Dean, assistant dean for research in the Batten College of Engineering and Technology, leads the NSF project.

"We're using these workshops to test the maker pedagogy and its potential for improving the effectiveness of learning for military veterans in STEM disciplines," Dean says. "The workshops provide an introduction to engineering subjects and include computer-aided design (CAD), rapid prototyping, 3D printing and bio-inspired robotics."

Navy veteran and incoming ODU freshman Davis Takhvar, a native of San Luis Obispo, California, and a prospective electrical engineering major, attended the workshop.

"It was very fun," Takhvar said. "I built a robot that did not walk very well, to be honest, but I learned that engineering is more than just one discipline. It's a combination of multiple skills from different fields that you need to utilize to complete a job."

Workshop instructors included Kaipa; Vukica Jovanovic, associate professor of mechanical engineering technology; Otilia Popescu, assistant professor of electrical engineering technology, and Karina Arcaute, assistant professor, STEM education and professional studies.

"This workshop provided only a glimpse into the type of robotics offered at ODU," Kaipa said. "During the school year, students can explore many options in the growing field of robotics and move on to exciting interdisciplinary fields like soft robotics, bio-mimicry and autonomous robotics."

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