



X-Force Fellows Jack Pierson, Amy Lebanoff, and Lukas Baltzer are wearing the U.S. Army's "Warrior Suit" with mission partner Maj. Jake Wad, as part of their project to recommend further development of computerized exoskeleton which will reduce injuries, decrease exertion, and increase performance.

Students Deliver Solutions for National Security



The NSIN X-Force Fellowship engaged 139 students and recent college graduates from 66 universities through our summer program that provides top tech talent the opportunity to solve real-world national security problems.

Fellows in the 2022 X-Force Fellowship supported DoD mission partners across all branches of service by applying diverse skill sets to 56 challenging, real-time national security projects. Each week, students met with their military partners to identify pain points and better understand how to create feasible solutions for the DoD. Students also attended a weekly speaker series where they heard from professionals with experience in the public and private sector supporting the National Security Innovation Base. At the conclusion of the fellowship, students presented their final solutions to military commands at a demonstration day.

The X-Force Fellowship is one way NSIN is helping the DoD compete with private industry to attract top talent into its workforce.

“Our two [X-Force] students exceeded all expectations to the point that the principal investigators are looking to extend research opportunities, scholarships, and even future jobs within the Missouri Institute for Defense & Energy,” said Jesse Beaudin, Director of Research & Institute Programs at Missouri Institute for Defense & Energy. 🇺🇸

CIVIC-MINDED TECHNOLOGISTS VOLUNTEER FOR NATIONAL SECURITY



Thirty-eight private-sector tech industry volunteers offered their expertise to solve 20 DoD problems through a flexible service program called Tech Squad which matches professionals with science, technology, engineering, and mathematics (STEM) skills, to remote, part-time volunteer opportunities with DoD mission partners to tackle unclassified, digital- and software-oriented problems.

The Tech Squad showcased its solutions and products for the DoD over three demo days, held June 28-30, 2022. Highlights from the presentations included developing machine learning and artificial intelligence algorithms

for 3D-printed parts and modeling biometric data; creating code to evaluate and scale fuel supply chains and aircraft repair operations; and designing applications to identify and detect cybersecurity threats and geospatial activity.

The program is a win-win for everyone. Tech Squad military problem sponsors receive additional support from private-sector talent with relevant STEM experience and fresh perspectives to develop solutions to their problems. Tech Squad volunteers receive exposure to unique, mission-critical opportunities and add to their portfolios by solving real national security problems and serving their country. 🇺🇸

RICE ENGINEERING STUDENT JOINS DOD INNOVATION ECOSYSTEM



Christopher Conway quickly became immersed in NSIN programming while a student at Rice University. Conway graduated in 2022 with a B.S. in Electrical Engineering, and during his time as an Owl, participated in the NSIN Capstone and X-Force Fellowship programs.

“NSIN programs are definitely worth trying, and they provide real-world experiences and connections that would be otherwise impossible to attain for the vast majority of students,” Conway explained.

Conway’s experience began with the NSIN Capstone program where he was part of a team of six engineering students that helped the U.S. Coast Guard develop solutions to detect unmanned autonomous surface vessels that might be used to transport drugs into the U.S. Conway’s Capstone team solved the challenge by reverse engineering “micro-vessels” to test with Coast Guard sensors.

Micro-vessels are unique because they are autonomous and can avoid detection. Most recently, these have been used by drug smuggling organizations to carry up to 90 pounds of illegal narcotics, per payload, across maritime borders. Conway and his teammates developed a prototype that replicates these vessels and tested it against a multi-million-dollar surveillance system. The prototype went undetected during the trials. For their efforts, the team won a \$3,000 prize as the first place “innovation” winner at the NSIN Capstone Project Showcase.

The NSIN Capstone program is an opportunity for student technologists and entrepreneurs to serve their country and provide solutions to the

DoD while solving real-world national security challenges through existing university capstone courses.

“The NSIN Capstone program introduced me to the DoD innovation ecosystem and provided a real-world problem to hone my engineering toolkit.

Having completed the Capstone, I can now say that I am capable of generating a working prototype when given a complex defense task,” Conway said.

After experiencing success with the Capstone project, Conway applied for the NSIN X-Force Fellowship and was accepted to the summer 2022 cohort.

Conway was matched to a U.S. Air Force project to help develop a mobile runway manufacturing kit to enhance agile combat employment, focused primarily on deployment in austere environments. Conway and his teammates dubbed their piece of the innovation the “Rapid Runway Kit.” When asked about the potential impact the project could have, Conway said, “Should it be implemented at scale, our solution could save millions in budget and enable the construction of temporary runways even on small island regions. Even if our solution does

not get implemented, our research sheds light on some of the greatest issues faced by warfighters planning to land in hostile or austere environments.”

One of the highlights for Conway and his X-Force team was the opportunity to observe a Michigan Air National Guard demonstration that featured “a variety of combat airframes land and conduct mobility maneuvers on a highway for the first time in the U.S.”

Conway is currently a PhD candidate at the University of Illinois Urbana-Champaign. 📌



Christopher Conway at the Michigan Air National Guard Northern Agility 22-2 exercises.