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US DOE GRANT

NORFOLK PUBLIC SCHOOLS COLLABORATION TO SUPPORT STEM EDUCATION

PLUS: BAWAB NAMED ASME FELLOW

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ODU wins grant from the Department of Education for STEM workforce training

by Keith Pierce

The Frank Batten College of Engineering and Technology and the Darden College of Education and Professional Studies at Old Dominion University has received a $675,000 grant from the U.S. Department of Education aimed at supporting Career and Technical Education (CTE) programs. The Innovation & Modernization Grant (I&M) is designed to test new ideas by identifying, supporting and evaluating evidence-based strategies for improving CTE programs and ensure workforce skills being taught align with local labor market needs.

The "Computer Science Principles and Cybersecurity Pathway for Career and Technical Education" project supports an ongoing collaboration with Norfolk Public Schools to develop supplemental educational modules with B.S.-level cybersecurity courses at ODU. Led by Vukica Jovanovic, associate professor of engineering technology in the Batten College of Engineering and Technology, the funding will support a pilot program at Granby High School and ultimately expand into four other Norfolk high schools.

Among the key goals of the program are to increase access to STEM education for underrepresented high school students and to demystify computer science and cybersecurity by helping students and families understand the value of this curriculum in a data-driven society.

"We have to start taking the fear out of these STEM fields by creating awareness among these unrepresented groups," Jovanovic said. "We're going to achieve this by developing and delivering professional training workshops to CTE high school faculty focused on computer science and cybersecurity and by engaging college students to serve as mentors and role models to the high school students."

With the high military influence in Hampton Roads, both public- and private-sector computer science and cybersecurity jobs are increasing.

"Jobs requiring workers with high-tech skills, such as computer science and cybersecurity, are constantly being created in our area and beyond, yet employers say they are not able to find competent employees to fill these positions," Jovanovic said. "The educational modules we develop will not only help high school students have an easier transition from secondary education to postsecondary education, but they will also be well-aligned with industry needs for those students going straight into employment."

ODU Engineering student, Danijela Celar (right) mentors Granby HS student

Co-principal investigators on the project include Murat Kuzlu, assistant professor of engineering technology; Honqyi (Michael) Wu, director of ODU's Center for Cybersecurity Education and Research; Linda Vahala, associate professor of electrical and computer engineering; Otilia Popescu, associate professor of engineering technology; and Petros Katsioloudis, professor & chair of STEM education and professional studies in the Darden College of Education and Professional Studies.

"We know that access to high-quality career and technical education options can open up new pathways to success for students," U.S. Secretary of Education Betsy DeVos said in a press release. "It's gratifying to see each of these grantees rethinking education and modernizing workforce training in their communities to ensure students have the skills they need for in-demand, high-paying jobs."

Because Old Dominion University has been identified as a National Excellence Center for cybersecurity education, the secondary cybersecurity educational pathways could lead to entry into B.S., M.S. or doctoral programs at the University.

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Ten weeks. Three summers. Thirty undergrads

Research Experiences for Undergraduates program focused on cybersecurity

by Keith Pierce

Motivated by cybersecurity research, 30 undergraduate students from institutions across the nation participated in the Research Experiences for Undergraduates (REU) program at Old Dominion University. Funded by the National Science Foundation (NSF), Old Dominion's cybersecurity REU program has allowed students to conduct cutting-edge cybersecurity research with faculty mentors at the University during the summer months. The 10-week program engages undergraduate students in ongoing NSF research areas or in research projects specifically designed for the REU program.

"The REU program has been tremendously successful in showcasing student research accomplishments and promoting graduate study and cybersecurity workforce development," said ChungSheng Xin, professor of Electrical and Computer Engineering, who co-leads the program. "Twenty REU students in the summer of 2017 and 2018 have already published ten technical papers in journals or conference proceedings."

Among the 30 REU students in the ODU program, 18 were enrolled or intend to go to graduate schools and 7 already worked or intend to seek employment in cybersecurity.

Shuyi (Nick) Liu, an ODU REU student majoring in computer science at Vanderbilt University, received the Jay Liebowitz Outstanding Student Research Award for a paper titled "Research on Security Visualization: A Survey." Presented at the 59th Annual Conference of International Association for Computer Information Systems (IACIS) held this month in Clearwater Beach, Fla., the award recognizes an outstanding research paper.

While the research papers may be co-authored by other students and/or faculty, the research must be based on a student-initiated project. Guided by his advisor, Wu He, associate professor of information technology in the Strome College of Business, and Xin Tian, a former Old Dominion University doctoral student currently serving as assistant professor of information technology at Kennesaw State University, Liu's paper investigates and analyzes the progress of security visualization over the past 10 years and not only covers a variety of security visualization tools and techniques introduced, but also covers applications and evaluation systems proposed.

The REU program is highly competitive. Each student receives a $6,200 stipend, free on-campus housing and travel support.

"Every year we received over 100 applications from institutions across the nation," said Xin. "We chose 10 students each year who were strongly motivated to conduct cutting-edge, multidisciplinary research to work with faculty mentors at ODU for ten weeks during the summer."

Professors Khan Iftekharuddin and Chunsheng Xin (far right) with students in the 2019 REU cybersecurity program

Xin and He lead the ODU REU cybersecurity site along with Khan Iftekharuddin, professor of electrical and computer engineering and associate dean for research in the Batten College of Engineering and Technology and Jiang Li, associate professor of electrical and computer engineering.

The REU program also received support from faulty in the Center for Cybersecurity Education and Research, including Professors Hongyi "Michael" Wu, Brian Payne, Sachin Shetty, Danella Zhao, Jeremiah Still, Cong Wang and Dylan Wittkower.

"Our faculty mentors offered research projects across multiple disciplines, from malware classification, Internet of Things security, homomorphic cryptography on digital manufacturing, cyberbullying study, and intrusion detection, to radio frequency-based drone classification, and cybercrime analysis," said He.

REU activities included seminars, graduate study panels, career panels, and a final oral and poster symposium, as well as field trips to the Navy Cyber Defense Operation Command (NCDOC) in Suffolk, Virginia and the Norfolk Naval Base where students were able to hear from Navy cybersecurity experts.

The REU students also actively participated in outreach to the local community and organized REU panels in annual Cybersecurity summer camps for local middle and school students and teachers hosted at ODU.

Sebastian Bawab named American Society of Mechanical Engineers Fellow

by Keith Pierce

Sebastian Bawab, professor and chair of Mechanical and Aerospace Engineering at Old Dominion University, has been elected as a Fellow to the American Society of Mechanical Engineers (ASME). This is the highest elected grade of membership within ASME; the Fellow distinction is bestowed on only 3% of the society's more than 100,000 members and recognizes exceptional achievements and contributions to the engineering profession.

Nominated by ASME members and conferred by a committee of past presidents, a member must have 10 or more years of active practice and at least 10 years of active corporate membership in ASME to be elected a Fellow. A nominee must also have documented formal recognition from students and colleagues as an outstanding teacher, an established international reputation and a publication record in teaching, research and leadership, among other requirements.

"This is a tremendous honor to receive recognition in an industry I've very much enjoyed being a part of," said Bawab, a member of ASME for just over 30 years. "Mechanical engineering has evolved from focusing on machines, like steam engines in the old days, to a focus on the design, construction and use of mechanical devices. This includes advanced manufacturing, robotics and machine intelligence. This has kept the field exciting for me."

Bawab has worked at the University for over 27 years, including the past seven years leading the largest department within the Batten College of Engineering and Technology, which serves approximately 30 percent of the undergraduate students in the college. He has guided the steady growth in graduate and undergraduate enrollment and founded the motorsports and first additive manufacturing laboratories. "My time at ODU has been both rewarding and challenging," Bawab said. "Having the freedom to grow our department by developing new programs and by recruiting committed faculty who have obtained millions of dollars in sponsored research has played a significant role in my success. I owe a debt of gratitude to many people."

Bawab has received the distinguished Society of Automobile Engineers (SAE) Ralph E. Teetor award for early career engineering educators and has been recognized among the nation's leading experts in computational biomechanics. He has consulted as an expert witness on several high-profile cases, offering a unique perspective on accident

Sebastian Bawab

reconstruction using computational biomechanics as fact-finding evidence for civil and criminal litigations. He holds several patents in his area of expertise.

In addition to biomechanics, Bawab's teaching research and publication interests span a range of topics including kinematics/dynamics, finite element analysis (FEA) and multibody dynamics. His sponsored research totals more than $5 million from the National Science Foundation, Office of Naval Research and others.

Bawab received a bachelor's degree and a master's degree both in mechanical and aerospace engineering from the State University of New York (SUNY)-Buffalo. He received his Ph.D. in mechanical engineering from Ohio State University as a student of famed robotics pioneer Ken Waldron.

VIDEO SPOTLIGHT: RICHARD HARRELL

Mechanical engineering student and local wrestling coach is fighting deadly brain disease.

Learn more from news coverage by WAVY 10 News in Norfolk.

Modeling and Simulation among topics at Board of Visitors update meeting

by Harry Minium

The Old Dominion University Board of Visitors recently heard an encouraging presentation about how ODU's Virginia Modeling, Analysis, & Simulation Center (VMASC) is adapting to the digital economy to expand its leading role as an innovative research center.

As the nation's trailblazing modeling and simulation center, VMASC has produced more than $100 million in research in its 20 years. Eric Weisel, executive director of the Suffolk facility, plans to focus the center's efforts more on digital technology for high-tech research and commercializing intellectual property.

Recently, ODU collaborated with Huntington Ingalls and Newport News Shipbuilding to cooperate in digital shipbuilding.

Wiesel said ODU's location on the Port of Virginia and adjacent to Naval, Army and Air Force bases, and the talent of researchers at the University, means ODU could become a national leader in digital shipbuilding.

He also reported on the recently formed Virginia Institute for Spaceflight and Autonomy (VISA), a joint effort with Virginia universities, which was begun with a grant from the General Assembly. The center will expand efforts to design autonomous vehicles and satellite payloads, technologies for space-based systems and data engineering for space-based data.

David E. Bowles, director of NASA's Langley Research Center, was recently hired to head VISA.

Weisel said Bowles will be based at Wallops Island, where spacecraft are launched, and that the University is hiring researchers to work with him.

Weisel said ODU recently was asked to join the Systems Engineering Research

Center, along with Virginia Tech and South Florida. MIT, Penn State and Southern California are also members.

"We're very excited about this partnership," Weisel said. "It opens up a flow path for Department of Defense funds that only a handful of universities have access to."

(Photo courtesy Inside Business/ HANDOUT)

Anne Voors, a senior majoring in Civil Engineering, was mentioned in The Virginian-Pilot's Inside Business. She received a summer civil design internship with architecture and engineering firm Clark Nexsen in Virginia Beach through the Hampton Roads Association for Commercial Real Estate. Voors said the program helped expose her to a multitude of players in the industry.

"I was really blown away by the collaboration that is needed in economic business development around Hampton Roads," she said. "I loved being able to get a fresh eye on something that I wasn't totally familiar with and how I can play a big part in that world as a well."

Read more: tinyurl.com/AnneV-CEE

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