DREAM INTERNSHIP

ODU engineering PhD student lands internship with Pixar

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PLUS:
- Visit from former NASCAR pit crew chief
- Vision Lab places 2nd brain tumor challenge
YOUR OPPORTUNITY TO HELP THEM CROSS THE FINISH LINE!
ODU MOTORSPORTS & CONCRETE CANOE TEAMS NEED YOUR HELP!

Motorsports:

ODU Motorsports is raising money to take two teams – ODU Baja SAE (Society of Automotive Engineers) and Monarch Racing Formula SAE to the next level in future years. Ranked the #1 Motorsports program in Virginia, both teams offer students at Old Dominion University a chance to design, fabricate and race our respective vehicles in international competitions.

The teams must raise $5,000 for materials and other costs in order to build cars for competition.

CLICK HERE to learn more or to donate TODAY!

Concrete Canoe:

The American Society of Civil Engineers (ASCE) Student Chapter needs to raise $750 to help get the canoe team to the regional competition in West Virginia. The ASCE Student Chapter strives for students to grow by participating in team-building, problem-solving and planning events such as the ASCE Concrete Canoe Competition. Each team must design and construct a canoe from scratch made of lightweight concrete aggregate and compete in aesthetics, technical and racing of the canoe. During planning and building, students must determine canoe dimensions, mold type and aggregate makeup.

CLICK HERE to learn more or to donate TODAY!
Growing up, Daniel Perez knew he loved two things – movies and computers. At a very young age, he became a huge fan of Pixar because, for the first time, he saw his passions fused together. Recently, his dreams came true when the Old Dominion University Ph.D. student landed an internship with Pixar Animation Studios, a subsidiary of Walt Disney Studios.

“Growing up, I always wanted to work as a filmmaker, but I didn’t know how to achieve that. When I got the internship at Pixar, it was like a dream come true,” Perez said. “I was very excited to be a part of Disney Studios.”

Part of the computer graphics research team at Pixar, Perez worked as a studio tools research intern. He worked with the tools department responsible for developing the tools animators and artists use to create popular films such as “Toy Story,” “Monsters, Inc.,” “Coco” and more. He even had the opportunity to catch a sneak peek of upcoming films.

“There were a lot of screenings where we were able to review sequences of what some of the animators had so far and take part in Q-and-A’s,” Perez said. “There were also events and activities to learn about computer graphics. I also took advantage of free classes at Pixar University and learned a lot about how movies are made and how the animation industry works. It was all very interesting and very exciting.”

Born and raised in Madrid, Spain, Perez came to the United States six years ago as a college student when his father, who worked with NATO, was assigned to Norfolk Naval Station. As a CMSE graduate research assistant, his focus is deep learning and computer graphics. He hopes to work in film or for a special effects company where he can apply his computer and simulation engineering knowledge to filmmaking.

“Computer graphics has a big impact on modeling and simulation because we need high-quality graphics to make simulations more realistic. That’s why doing computer graphics research is so important to film animators, because they are looking to make animations as realistic as possible,” he explained. “This internship at Pixar has given me contacts and experience useful for a future dream job.”

Perez has a B.S. in computer engineering with a minor in computer science from ODU.
Cleaning bathrooms and mopping floors to work his way up, former NASCAR pit crew chief Robert “Bootie” Barker was willing to do whatever it took to gain a motorsports career. Even being paralyzed from the waist down after a high school car accident didn’t stop the Old Dominion University alum from chasing his racing dreams.

On the eve of ODU’s Homecoming football game, Barker visited the motorsports lab in the Batten College of Engineering and Technology.

“Be willing to work for free,” he told the motorsports students. “I started in racing by cleaning the bathrooms at a garage, then I worked up to mopping the floors, and I slowly worked my way up. You’ve got to be willing to do things like that and work your way up in racing.”

Now an engineer for Leavine Family Racing, Barker grew up next door to the famous South Boston Speedway. He played high school football in the small southern Virginia town of Halifax and loved the thrill of competition.

As a junior studying mechanical engineering at ODU, Barker heard a radio announcer discussing the engineers who build shocks for race cars. He immediately realized racing was the perfect industry to put his engineering degree to work while satisfying his competitive instincts.

With their respective vehicles on display, students from ODU’s Formula Society of Automotive Engineers and Baja clubs shared their experiences and asked Barker for advice.

“If you want to go far in the world of motorsports, get with the best driver you can find and go as far as you can with them,” he said. “What we as engineers do is important, but at the end of the day, the driver is the real difference maker.”

One student asked Barker what could be done to improve their formula-style car. Barker looked at it closely for a bit. “What are the rules?” he asked. “What can you add to the tires? How much downforce can you add? What are the limitations? You’ve got to familiarize yourself with the rulebook.”

He stressed this point several times during his visit.

Another student asked about the use of simulation in NASCAR.

“You’re basically in a big IMAX theater with a car in the middle. There are pedals and a steering wheel, and you can feel everything. If something is too tight or there’s some other issue, you can feel it. The key difference between simulation and actually being out there on the track, though, is that you know you’re not going to die,” said Barker, drawing laughter from students.

Later that evening, Barker was honored at the Alumni Honors Dinner, an annual banquet recognizing graduates who have excelled in their professions and impacted their communities.
Old Dominion University among world’s best in computer-aided tumor grading

Vision lab places second in international brain tumor classification challenge

by Keith Pierce

This year, roughly 24,000 adults in the United States will be diagnosed with a brain tumor. For early treatment and therapy planning, it is essential for health professionals to know the grade or classification of these tumors. That’s where researchers from Old Dominion University’s Vision Lab have been ranked among the best in the world.

More than 80 teams from around the world competed in the 2019 Computational Precision Medicine: Radiology-Pathology Challenge on Brain Tumor Classification 2019 (CPM-RadPath) challenge. Results were announced at the Medical Image Computing and Computer Assisted Intervention Society (MICCAI) conference in Shanghai, China.

ODU’s Vision Lab placed second between the first-place team, Shenzhen Institutes of Advanced Technology/Chinese Academy of Sciences, and the third-place team, National Taiwan University of Science and Technology.

“We are honored to be considered among the world’s best when it comes to this extremely important type of research,” said Khan Iftekharuddin, associate dean for research and graduate programs for the Batten College of Engineering and Technology and director of the ODU Vision Lab. “This recognition puts the ODU Vision Lab, the Batten College of Engineering and Technology and the University in the spotlight on the global stage.”

Analyzing and classifying brain tumors is traditionally done by pathologists who examine tissue sections under a light microscope. This process continues to be widely applied in clinical settings, yet translating it to bedside and clinical research studies involving hundreds or thousands of tissue specimens remains a challenge.

“Considering the huge amount of digital imaging data collected and reviewed by the clinicians every day in clinical settings for brain tumor classification, discovery of effective methods is needed to automate and scale-up tumor classification,” Iftekharuddin said. “These methods are expected to bring precision translational medicine for brain tumor patients a step closer.”

According to MICCAI, computer-aided classification has the potential to improve the tumor diagnosis and grading process, as well as to enable quantitative studies of the mechanisms underlying disease onset and progression.

With funding from the National Institute of Biomedical Imaging and Bioengineering, at the National Institutes of Health, the ODU Vision Lab has been developing advanced computational modeling and machine learning methods for effective analysis of this radiology and pathology imaging big data for tumor detection, segmentation, grading and patient survival prediction for more than a decade.

“I'm very proud of the ODU Vision Lab team that, in recent years, has also won first place in brain tumor survival prediction category; and third place in brain tumor segmentation category in the Multimodal Brain Tumor Segmentation Challenge,” Iftekharuddin said.
A study by two Old Dominion University researchers about the potential cost-savings of a city strategically buying houses prone to damage from severe storms was recently awarded top paper at an international engineering conference.

At September’s Institution of Civil Engineers Coastal Management 2019 conference in La Rochelle, France, a paper by Joshua Behr and Carol Considine was singled out from among 175 submissions from many countries for its novel and groundbreaking approach to mitigating damage from storm damage and flooding as sea levels rise worldwide.

“One of the recognition at the conference came from the contrast,” said Behr, associate professor at ODU’s Virginia Modeling, Analysis and Simulation Center (VMASC). “Every other presentation involved hardening coastlines and building protective barriers. No one considered the value of strategic retreat.”

The paper by Behr and Considine, supported by funding from the Commonwealth Center for Recurrent Flooding Resiliency (CCRFR), makes the case that there can be a greater return on investment over time for communities systematically buying parcels of storm damage-prone properties than for building massive flood-protection infrastructure or periodically rebuilding flood-damaged homes.

Because of a lack of trust within communities about governments buying private citizens’ homes, “retreat is one of the adaptation strategies not discussed very often,” said Considine, assistant dean and associate professor with ODU’s Batten College of Engineering and Technology.

To investigate the business case in support of this approach, Behr and Considine used the Federal Emergency Management Agency’s (FEMA) HAZUS program to project residential damage estimates from three storm simulations. From those damage estimates they determined a “pilot program area” - an area that had repetitive loss, that was partly located within a Special Flood Hazard Area (SFHA). The pilot program area was then evaluated for buyouts based on property values.

Behr and Considine assumed a modest municipal investment of $1 million per year in voluntary buyouts of vulnerable residential homes, vacant lots and church properties over 31 years. This would then transform the area into multi-use green space, with parks and a water basin that could be used for floodwater retention and recreation by residents.

The projected cost savings were just under $40 million, showing a return on investment of 20 percent with a single major storm event. Future research will investigate methods for incentivizing this type of strategic green space buyouts while avoiding the pitfalls of gentrification often associated with relocating residents.

The researchers’ estimates of return on investment also includes the savings over time in housing displaced populations as well as reductions in mortality and health savings stemming from improved physical and mental wellness of residents. As well, “there are positive returns on investment in population well-being from the creation of green space,” Behr added, which are not included in the calculations.

While this analysis focused only on the pilot program area, Considine said the methodology could be followed to suggest the best course of action for low-lying residential neighborhoods in any flood-prone coastal community.

“If we’re going to talk about sea level rise, we need to talk about our vulnerable communities and start that adaptation process, rather than wait. Be preventive,” she said.

Established in 2016, the Commonwealth Center for Recurrent Flooding Resiliency (CCRFR) engages the expertise, resources, and intellectual vibrancy of the College of William & Mary and Old Dominion University in support of building resilience to rising waters.