Dr. Christos Mousas is an assistant professor and director of Virtual Reality (VR) Lab in the Purdue Department of Computer Graphics Technology (CGT). One of his recent projects, completed with five others, explored a virtual reality version of climbing some of the most difficult and famous rock faces around the world. The project was called “Environment-Scale Fabrication: Replicating Outdoor Climbing Experiences.”

Because travel is not realistic for everyone, having the replications of popular climbs available in a climbing gym eliminates the need for travel, and creates a solution for the climbers that are training for a competition, want to climb a specific route, or do not have the resources to travel. The method allows to automate the process, which can be repeated in a gym setting for any section of a climb.

At the time of the project, Mousas was located in New Hampshire, which is famous for mountains and the sport of rock climbing. He and five others wanted to replicate the best outdoor climbing experiences, but in the setting of a climbing gym. This new process of recreating sections of famous walls would help people to train and prepare for the sport.

To begin the process of reconstructing a rock wall, the team filmed a climber completing the section. Their input data were DSLR photographs, and the output was a 3D reconstruction. They used the skeletal data from the video of the climbers, who helped the researchers when they went to the sites for data collection.

For the climber pose reconstruction step, all the points of the wall that he used and the way that he used them were filmed, recorded, and replicated on a computer using photogrammetry to turn the images into exact geometry.

Then, they created 3D holds using 3D printing methods and foam cutting, creating the model and the casting the hold. They finalized the location reconstruction of the T-nuts, using T-nut optimization to find the best fit in the gym setting.

Lastly, the group tested the method to see if climbers climbed it the same way. A side by side comparison of the climber on the original wall outdoors versus
Dr. Gray, to enterprise software collaboration with Dr. Toombs, to design ethics and pedagogy by from work on community, identity, and relationships Research in the studio is conducted through four explained Dr. Gray.

For a range of research collaborations to take place. As UX program lead, Dr. Gray is passionate about the importance of the studio for students. "We have wanted a physical home for our studio-based UX design program was launched in 2015. This space provides continuity to our student experience and serves as a 24/7 resource for intensive collaborative work—spanning our UX design curriculum and our research labs."

**PROFESSOR NANCY RASCHE**

Professor Nancy Rasche is an Assistant Professor of Practice in the User Experience Design major and does research in the area of enterprise software usability and design. Rasche was one of the faculty that helped to form the UXD major in Purdue's CGT department. When the Experience Studios started in 2015, she was tasked with leading the course. With an increasing number of students and industry sponsors getting involved each year, it has become a unique industry engagement course with 95 students and 12 industry sponsors. (http://www.ecn.purdue.edu/ExStudio/)

The Experience Studios is a multi-level course with freshmen through grad cohorts integrated in teams that are paired with an industry sponsor. The sponsors range from large corporations to small startup companies. The teams work directly with their sponsor on a semester-long project where they come up with goals, deliverables, and present on their progress. Rasche works as one of the managers, meeting with each team often to provide feedback to keep them moving forward. By the time the students graduate in the UXD major, they will have 3.5 years of industry experience and have served in a variety of leadership roles.

Along with her teaching at Purdue, Rasche works with Ford Motor Company. For the past four years, she has worked on a variety of research projects including the recent alliance project to help them evaluate and improve their integrated software system. The challenge is that there is so much data spread out over different systems and databases, that it makes finding a specific drop of water in Lake Michigan," explained Rasche.

Her current Ford project included the evaluation of current engineering processes, development of a software solution to improve visibility and manipulation of data results, and creation of a design system to support future user interface development. Her final goal is to develop "a single point of reference" design system repository based on her work that the software designers and developers will use to apply consistent user interface design standards during development in a quicker, more effective process. The benefit of having a single design system for the whole company will be to allow the software system to be more accessible, allow work to move faster and be more collaborative, and the amount of data shown will be streamlined into user workflows that will improve the software usability for all stakeholders. Rasche is currently in the process of finishing this project.

Nicole Gebhardt, a 1993 technical graphics graduate, was in the "small but mighty" first graduating class of the technical graphics four-year degree from Purdue CGT. Her success in both corporate America and in entrepreneurship has provided valuable experience in the extremes of big and small business.

Nicole started her professional career working in public affairs and managing employee communications for Caterpillar. Starting as a college intern, she climbed the corporate ladder to the point she advised and was mentored by multiple Caterpillar vice presidents. "It was an incredible opportunity to spend sit at the table with some of the sharpest business minds in the world," says Nicole. That’s where she says she fell in love with business and strategy; and where the diversity of her Purdue education began to fall into place. "I wasn’t using my degree in the way I’d expected," she adds. "But I knew how to interpret data, organize it, and share it in a way that people understood and that’s what helped me advance."

Nicole is still grateful for CGT’s visionary leadership, so she was excited to see her daughter enroll in UX Design at Purdue last fall. As a business owner, Nicole believes CGT’s greatest asset is their culture of experience-focused curriculum. "They have a strong grasp of return on investment and what matters in business and for the student’s overall development. I trust them to prepare her for the wide variety of opportunities she’ll have in her career."

Today Nicole owns her own consulting and publishing company, Niche Pressworks, where she advises business leaders on marketing strategies and book publishing. Her company has helped over 150 people in five different countries write and publish a book for strategic reasons.

Ironically, publishing was one of the skills TG taught in the 90s. So was entrepreneurship, which is what gave her the edge when she decided to trade in her corporate career for the opportunity to work from home while raising her two daughters. "The business has evolved based on my time and priorities. Right now, we're in another major growth phase. Navigating all the business challenges of strategy, leadership, customer delivery, etc. keeps things fresh and exciting and my degree remains relevant to me to this day."

Her advice for her daughter and other CGT students: keep learning and growing. "I invest thousands of dollars annually in courses, conferences, and training to study what’s working now. Business is evolving quickly. If I stopped, I'd be failing my business and my clients."

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