buckeye/engineering

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Getting high-tech down on the farm

INSIDE/

THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Precision agriculture: High-tech down on the farm

Forget 80,000 pound tractors—one day fields could be worked by much smaller, remotely monitored unmanned autonomous vehicles. Combining data from those sensor-rich machines with high-resolution field imagery would provide the status of every soil plot, seed and plant in the field. By deriving actionable insights from real-time data, precision agriculture promises to help farmers increase food production, efficiently use resources and reduce environmental impact.

Precision agriculture means “doing the right thing, at the right place, at the right time” and Buckeye engineers like Scott Shearer are at the forefront of creating the tools and technology to maximize its potential.

Shearer, a world-renowned professor and chair of food, agricultural and biological engineering, leads many of Ohio State’s precision agriculture research efforts. His work is focused on autonomous multi-vehicle field production systems, unmanned aerial systems for remote sensing and managing the agriculture dataspace. He hopes to establish an agriculture data co-operative at Ohio State, which, in partnership with industry and farmers, could provide new research opportunities.

“Many agriculture producers are skeptical about sharing their data with large corporations,” Shearer said. “I think there is an opportunity for land grant institutions, especially The Ohio State University, to act as an honest broker of the data.”

Learn more: go.osu.edu/dotf

Graduate programs emphasize collaboration

World-class faculty, state-of-the-art laboratories, and top-notch interdisciplinary education and research—these are just a few of the things that set The Ohio State University College of Engineering's graduate programs apart.

Ranked first in Ohio and 18th among public universities nationwide by *U.S. News & World Report*, the college's graduate offerings include 12 engineering and four Knowlton School programs—plus collaborative master's programs in global engineering leadership and business logistics engineering.

"We have a culture of collaborative, interdisciplinary education and research that benefits students during their education and throughout their careers," said La'Tonia Stiner-Jones, who leads the college's Office of Graduate Education.

Mechanical and Aerospace Engineering Associate Professor Rob Siston strongly believes in the importance of interdisciplinary training—and he makes sure his students get it. They're co-advised by and conduct research with faculty from disciplines such as orthopedics and physical therapy. Plus they take advanced medical classes.

"I think the way things are going in engineering and business today, you can't just be proficient in one engineering discipline," he said. "You go farther and have a more satisfying career if you are trained in an interdisciplinary fashion; it's up to you to decide what those disciplines are."

Learn more: go.osu.edu/gpc

Engineering an NFL career

Ohio State alum Jake McQuaide has one of the world's most unique occupations. As the starting long snapper for the St. Louis Rams, he's on the field for every punt, field goal and extra point. Since NFL teams only have one long snapper on the active roster, he's one of just 32 people in the U.S. who can claim that job title.

What makes McQuaide even more unique is that he is a proud alumnus of The Ohio State University's Aeronautical and Astronautical Engineering program (2011). It's probably safe to say he's the only NFL long snapper who can run a transonic wind tunnel research project to test dynamic stall on a Blackhawk rotor blade.

Now in his fourth season with the Rams, the College of Engineering's favorite NFL player fondly recalls his days as a Buckeye engineer, and as a player wearing the scarlet and gray in the Rose Bowl. And while he's vibrantly living his dream of playing professional football, his idea of a dream job after he hangs up his cleats may surprise you.

Get to know Jake in a full online Q&A: go.osu.edu/mcq

Photo courtesy of SSM Health Care Foundations

Passport to learn and serve

From Honduras to India—and many countries in between—Buckeye engineers and architects are making a difference abroad.

In Choluteca, Honduras, necessities like clean water, sanitation, reliable electricity and adequate healthcare are far from guaranteed. Students complete a semester-long class before making a two-week trip to Choluteca to implement projects such as teaching local residents to make a DIY, human-powered nebulizer, and installing a rainwater collection and filtration system.

Meanwhile, during a 10-day trip to northern India, Buckeye engineers learn about Indian history, culture, society, and design and production constraints for creating prosthetic devices for the developing world.

"Service learning is an effective educational tool," explained Lecturer Roger Dzwonczyk. "It takes the engineering skills students learn in the classroom and puts them to practical, meaningful use solving real-world problems."

Buckeyes are passionate about humanitarian-based endeavors. In order to support their interests and the world's need for engineers, the college launched a Humanitarian Engineering Center and a new global option that lets students earn a transcript designation for their international experiences.

Learn more: go.osu.edu/globe

Engineering enlists in battle against cancer

Cancer research and treatment gains momentum later this fall with the opening of the new James Cancer Hospital and Solove Research Institute, part of The Ohio State University's Wexner Medical Center's $1.1 billion expansion.

That Ohio State is a world leader in cancer care and innovation is not breaking news. But what may surprise some is the important role engineering serves in the fight against cancer.

The College of Engineering's faculty and researchers are currently working on more than 35 cancer-related research projects. Professor Jessica Winter's fluorescent, magnetic nanoparticles isolate circulating tumor cells to detect and diagnose cancer, and to identify biomarkers critical for personalized treatment plans. Professor Samir Ghadiali is studying the effects of physical and mechanical forces on cancer progression. Alum Jed Johnson and Professor John Lannutti developed polymer nanofibers that let scientists study the invasive behavior of tumor cells and test the effectiveness of drugs in the lab. And Kinshuk Mitra developed a novel cancer diagnostic technology that allows for quicker and more effective cancer detection—while he was just an undergrad.

From conducting fundamental research to developing new diagnostic technologies and cancer treatments, Buckeye engineers are working diligently to be part of the cure.

Learn more: go.osu.edu/bac

Invented by Buckeye engineers, this nanofiber scaffold imitates human tissue to improve cancer research.

Drive, drive on down the field, engineers of the scarlet & gray

265 MILLION REASONS TO SAY "THANK YOU!"

The College of Engineering's goal is to raise $350 million during the university's *But for Ohio State* campaign, which is a $2.5 billion fundraising endeavor that invites those who believe in Ohio State to invest in our students, our faculty and our potential. Overall, the university has raised $1.99 billion* so far.

Thanks to the generosity of our alumni, friends and partners, the College of Engineering is charging down the field, and has raised $265 million*. Supporters are helping us secure educational opportunities for future generations of students and meet the enormous challenges we face as a society. Together, we will sustain an enduring tradition of scholarship, service and pride. Our end zone is in sight and together we can—and will—smash through to victory!

Big plays:

- College of Engineering alumni have donated 18% of the total $265 million raised, while other Buckeyes have contributed 5%.
- Corporate, foundation and organization partners have given 74% ($195 million). This includes foundation giving that may be tied to alumni donors.
- Buckeye engineering graduates of the 1960s ($18 million), 1980s ($13 million) and 1940s ($8 million) have given the most compared to classes from all other decades.

Learn more about the campaign: osu.edu/giving

*through July 2014

briefs:

Venturi Buckeye Bullet zooms to another record
go.osu.edu/abr

First-ever look inside working lithium-ion battery
go.osu.edu/battery

Bonnell-Kangas wins national TI competition
go.osu.edu/ti

Watch: Reaching out for diversity
go.osu.edu/reach

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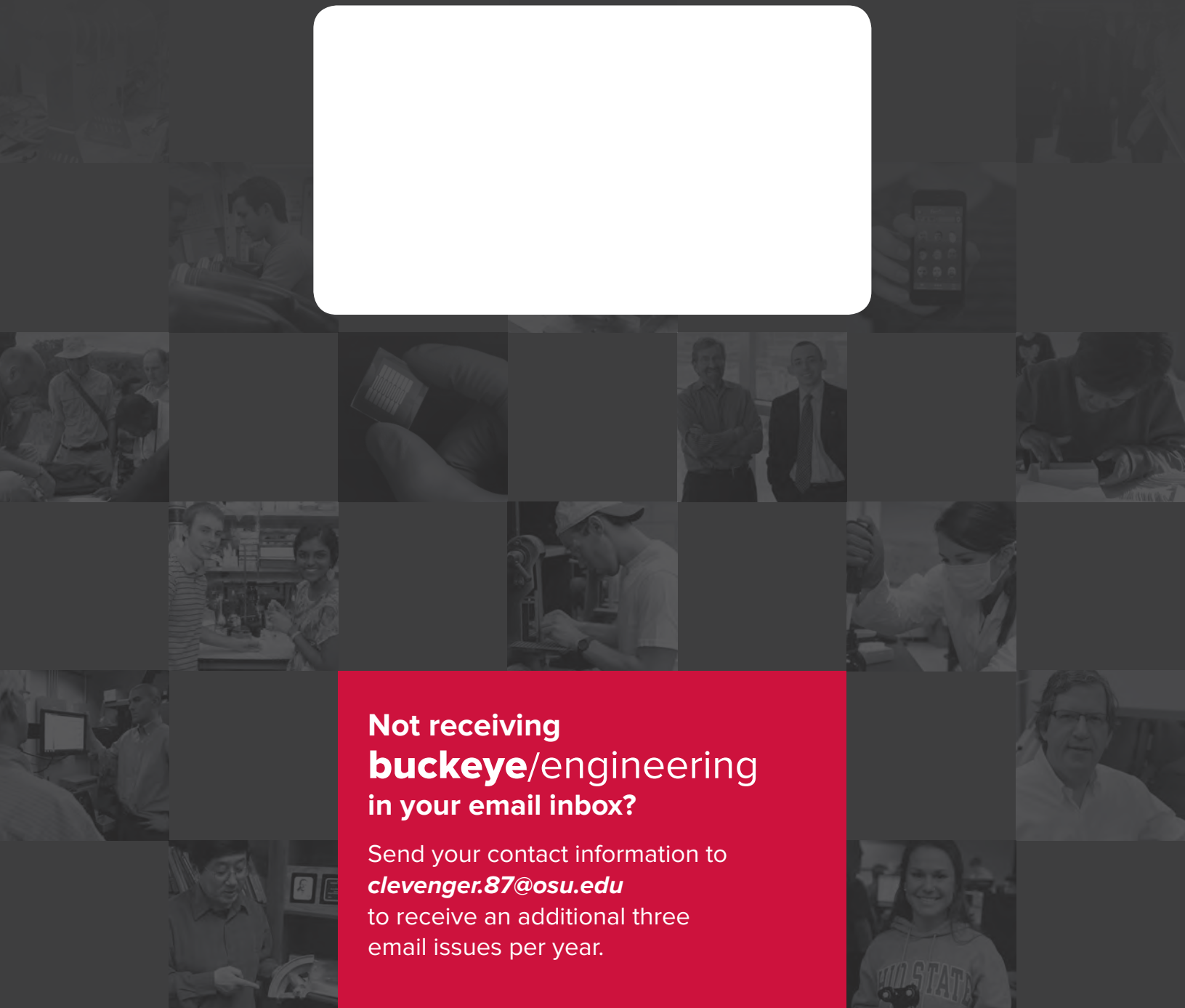

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