Outer Limits

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Remote Biology

Dezhen Song, assistant professor of computer science at Texas A&M University, is collaborating on a remote, robotic camera system that will give researchers and the public a chance to snap photos of rare animals - all from the comfort of a desktop PC. The technology could be used to meet various needs, from tourism to monitoring a crisis. Song took the time to talk with *Texas Technology* about the Collaborative Observatories for Natural Environments (CONE) project.

Can you talk about the CONE project and how you got involved?

The National Science Foundation (NSF) is funding the project. I'm the principal investigator on the project, and we collaborated with UC Berkeley. CONE is about developing remote robotic observatories for natural-environment observation. We have deployed cameras at different sites for different applications. For example, we have deployed a camera to search for the ivory-billed woodpecker in Arkansas - that's called the ACONE [Automated Collaborative Observatory for Natural Environments] project under the umbrella of the CONE project. We've also deployed a camera in the [San Francisco] Bay Area for bird watchers to study birds in California.

It's a big project with two purposes: One is to develop robotic technology to assist natural scientists observing nature; the other is to give the general public remote access to nature for education purposes.

Ken Goldberg [UC Berkeley professor of engineering] and I are both project leaders on this. We got the funding from the NSF in 2005. The majority of funding goes to Texas A&M, and part of it goes to UC Berkeley. For example, the ACONE project was primarily built here at Texas A&M while the CONE SF [Sutro Forest] project is led by Ken at UC Berkeley.

Are there plans to deploy this to study animals other than birds?

Definitely. I have been collaborating with several other field biologists who are interested in applying the technology to watch animals like grizzly bears or panda bears in China.

Have you considered deploying a camera system in places where there is the potential to discover new species?

Yes. Actually we had a few conversations with people from Africa. There are other constraints associated with that. If we go out of the country, it can be a budget problem for us, but we would definitely like to explore such an opportunity.

How does it work on the user end? How do users experience CONE?

There are two kinds of users. Experts like field biologists - who are prioritized in the system so they have more control than other users in the general public. If they log on to the system, they can access all the data - both online data and archived data -and can control the camera with the highest priority.

As a general public user you can reach us just like a normal Web site and control the camera if a biologist is not online.

Have you thought about putting the cameras in exotic places around the world so people could virtually visit?

That is one of the primary motivations for this project. It's this idea of telepresence where you cannot be there physically, but you can present a remote environment. This is one area we're looking at - how to increase your sense of being there without actually being there.

In the future, we hope users can access the system through their cell phones - a ubiquitous telepresence. Bandwidth is one of the key issues in deploying these systems. Also, there is the power problem when deploying these in very remote places. You have to make sure you have a constant power supply from solar panels or wind generators.

For more information, visit <www.c-o-n-e.org>.

Cancer Connection

Researchers at the University of Texas' M.D. Anderson Cancer Center are learning that the body's chromosomes might be the key to understanding an individual's cancer risk. Lead researcher Dr. Randa El-Zein presented the findings at the annual gathering of the American Association for Cancer Research in Los Angeles.

The research showed that survivors of Hodgkin's disease - a cancer of the lymph nodes - who have a "greater genetic instability in their white blood cells," were more likely to develop other types of cancer.

El-Zein and her team studied 252 adults treated for Hodgkin's over a six-year period. The researchers examined the chromosomes found in the lymph nodes before and after treatment. During treatment and in the following 13 years, patients with a higher number of abnormal chromosomes displayed a higher tendency to develop another form of cancer.

"We can use this measure of genetic instability to identify patients at high risk and counsel them to continue regular screening for breast, colon and other cancers even after their Hodgkin's disease has disappeared," El-Zein. "We found that people with a higher level of chromosomal aberrations are the ones who developed a

second primary tumor."

- University of Texas' M.D. Anderson Cancer Center

Forensic Farm

Texas State University has proposed a creepy new research facility. The anthropology department hopes its forensics research lab will facilitate a better understanding of how human remains decompose and give law enforcement new knowledge to help solve crimes.

The "body farm" facility will let students and law enforcement personnel study how corpses rot under various conditions, such as when they're submerged in water or left in arid conditions. The university and researchers hope the lab will give police officers and forensic scientists new insight about outdoor crime scenes where evidence is often more difficult to obtain due to the weather and other factors.

Anthropology Professor Jerry Melbye said law enforcement agencies at the local, state and federal levels are interested in taking advantage of what would be the third such facility in the United States.

The lab will be surrounded by 12-foot walls and secured from local wildlife. However, construction plans for the San Marcos area stalled when concerns were raised about buzzards impacting passenger safety at the nearby San Marcos Municipal Airport.

- Texas State University

Auto Pilot

Lifelong friends and Murphy, Texas, residents Vernon Porter and Clarence Kissell are building what many in the past would be surprised doesn't yet exist. In a workshop behind Porter's home, the two are feverishly designing a flying car.

Their concept is a vehicle that can drive and fly, and is no larger than a sport utility vehicle. The men have constructed a fiberglass frame, and plans call for the vehicle to be powered by a Mazda RX-8 engine. So far, the pair have spent more than $70,000 of their own money on the project and are recruiting more investors to see them through to the prototype stage.

Building a viable flying car has proven an elusive goal. Moller International, based in Davis, Calif., has been working on the Moller Skycar for decades, and it's rumored that the company has poured more than $200 million into the (perpetually) soon-to-be-released vehicle. Porter and Kissell told *The Dallas Morning News*

they hope to raise $1.2 million to fund a working prototype.

The vehicle will use three wheels while on the ground and fly at approximately 150 mph when airborne.

Lump of Coal

In early May, a Texas company inked a deal to deliver coal power to Henan province in China. In today's eco-sensitive society, coal power hardly seems cutting-edge. But Houston-based Synthesis Energy Systems (SES) uses a different and cleaner method to extract energy from coal.

SES employs gasification, a process in which low-grade, high-carbon fuels, such as coal and petroleum, are fed into a machine that heats the materials to nearly 3,000 degrees Fahrenheit. At these temperatures, the materials that normally produce pollutants are broken down on a molecular level, producing instead environmentally friendly byproducts. Most of the coal is transformed into synthesis gas - or syngas - composed of hydrogen and carbon monoxide, which can produce electricity and methanol. Gasification converts solid materials into a sandlike compound useful in construction.

Henan is an ideal partner for SES. Its population has recently grown to more than 1 million, and the province is one of China's most productive coal producers.