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Computer scientists join in search for ivory-billed woodpecker

COLLEGE STATION ?Computer scientists from Texas A&M University and the University of California, Berkeley, have installed a robot in the Cache River National Wildlife Refuge to help natural scientists from Cornell University's Laboratory of Ornithology and the Arkansas Game and Fish Commission find the rare ivory-billed woodpecker.

The computer scientists ?Dr. Dezhen Song, assistant professor in Texas A&M's Department of Computer Science, and Dr. Kenneth Y. Goldberg, professor in UC Berkeley's departments of Electrical Engineering and Computer Sciences, and Industrial Engineering and Operations Research ?developed the robot, Automated Collaborative Observatory for Natural Environments (ACONE), to scan the skies near Brinkley, Ark., for birds.

"If the system can catch any kind of bird, that's a success for us," Song said. "But if it catches an ivory-bill, that's a bonus."

With a grant from the National Science Foundation, Song and Goldberg programmed ACONE to distinguish birds from other objects and only record the birds with its two digital cameras, Arecont Vision's AV3100s.

"It's a fast, flying object," Song said. "And also, the shape of the object ?the shape of the bird ?isn't regular. It's deformable, and from the lighting conditions, it's very difficult to capture."

The robot stores images of the birds it has recorded in the hard disks of its computer, Logic Supply Inc.'s S-625F. The computer as well as the cameras are housed in weatherproof cases.

"If you put a normal computer out there, it wouldn't function very long because of the humidity and the rain," Song said.

The hard disks are removed routinely from the computer by birdwatcher M. David Luneau, associate professor in the University of Arkansas at Little Rock's Department of Engineering Technology. Luneau enlists fellow birdwatchers to scrutinize the images stored in the hard disks for a shot of the ivory-billed woodpecker.

In addition to Luneau, the Arkansas Electric Cooperative Corp., Arkansas Game and Fish Commission, Audubon Arkansas, Nature Conservancy in Arkansas, U.S. Fish & Wildlife Service and Woodruff Electric Cooperative Corp. have volunteered to help Song and Goldberg install, maintain and power ACONE.

"You want to have these people help you," Song said. "Otherwise, you have a big problem."

Song and Goldberg took interest in the search for the ivory-billed woodpecker after Goldberg read an article about the search in The New York Times.

Goldberg contacted the co-leaders of the search from Cornell's Laboratory of Ornithology to volunteer systems he and Song were developing through their project, Collaborative

Observatories for Natural Environments (CONE).

"Cornell's ornithology lab and Arkansas Game and Fish are crucial members of this team," Goldberg said. "They've been leading the search in Cache River and have a deep understanding of the bird and this environment."

Scott Henderson, director of the Arkansas Game and Fish Commission, said he looks forward to continued cooperation among groups studying the ivory-billed woodpecker.

"It's exciting for this agency to be involved in cutting-edge technology as we continue to research and understand what can be done to improve the habitat for this bird," he said. "We're pleased to be working alongside our partners in this ambitious venture."

CONE purposes to help natural scientists observe animals ?whether birds or mammals ?in the animals' habitats. Song and Goldberg have developed robots to webcast images of animals from the animals' habitats to natural scientists' computers.

In addition to the Cache River National Wildlife Refuge, they've installed one of their robots in the Richardson Bay Audubon Sanctuary in California. Song and Goldberg have considered sites in Alaska and Rwanda to observe polar bears and gorillas, respectively.

"Our goal is to use the emerging capabilities of computers and networks to better understand the natural world," Goldberg said. "It's very exciting to work with researchers in fields beyond engineering."

The ivory-billed woodpecker seemed to have disappeared sometime in the 1930s or 1940s. In 2004, it was reportedly spotted in the Cache River National Wildlife Refuge.

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For more information about ACONE, visit http://www.c-o-n-e.org/acone.

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