New 'digital life' initiative aims to create 3-D models of all living creatures

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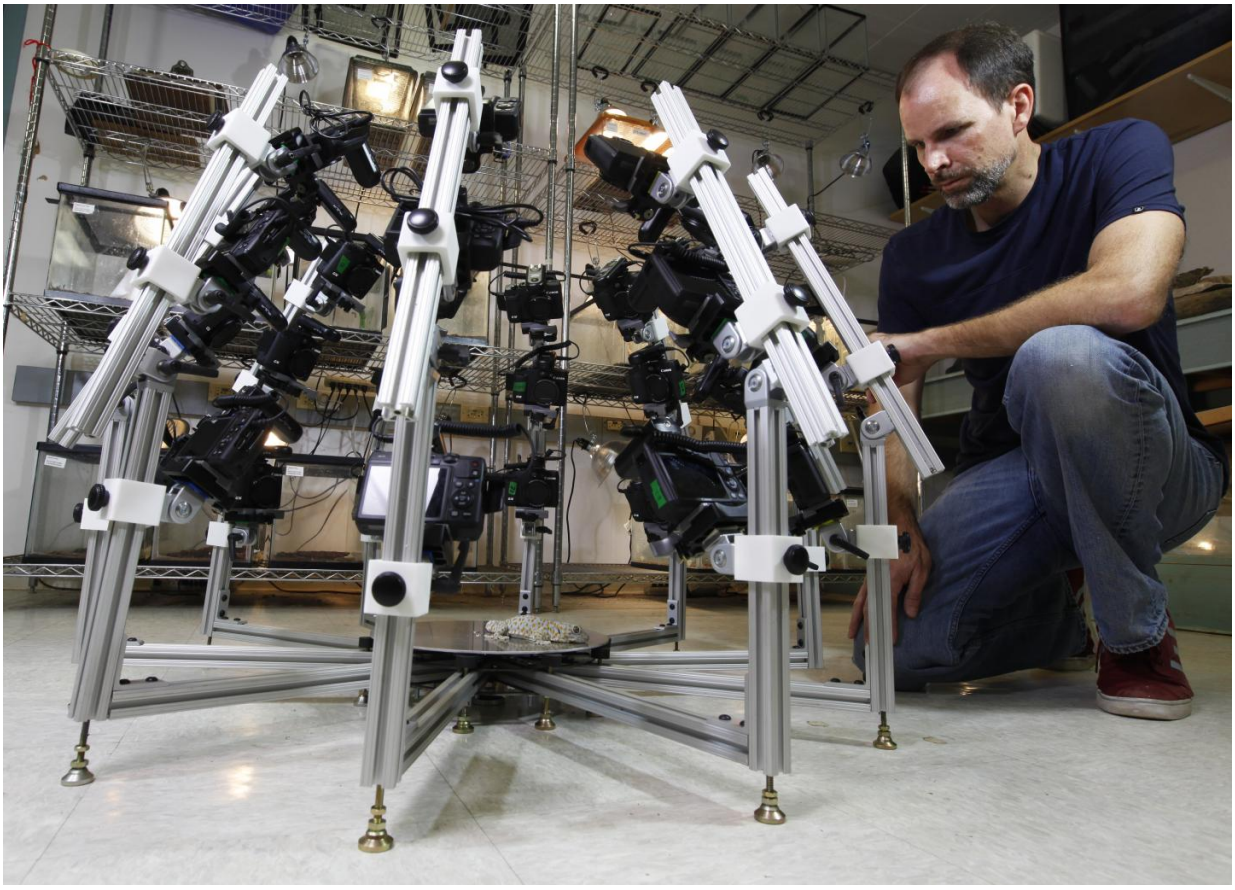

Irschick and colleagues initially created the Beastcam technology to create 3-D models of Philippine skink lizards and similar animals, but they quickly realized the technology's broader value. Credit: UMass Amherst

Scientists at the University of Massachusetts Amherst led by biologist Duncan Irschick who created the Beastcam Array, a rapid-capture, field portable tabletop system for making high-resolution, full-color 3D models of living organisms, now plan to use it in an ambitious effort to create 3D models of all living organisms.

The Beastcam Array consists of 10 fixed arms, each of which can mount three G-16 Canon cameras for a 30-camera array. Small animals placed in the array's center can be quickly and conveniently modeled in 3D by the cameras aided by software. Using this technology, Irschick and colleagues have created a new multimedia platform they call "Digital Life," and have already created 3D models of sharks, scorpions, toads and lizards.

In coming months, they hope to use the Beastcam Array, funded in part by the National Science Foundation and developed at UMass Amherst's Center for Evolutionary Materials, to create 3D models of two groups facing significant survival threats: frogs and sea turtles.

He says, "We are excited to use the Beastcam technology to preserve the digital heritage of all life on Earth. This will take several lifetimes, but we are thrilled to begin the journey. Digitally preserving the heritage of life on Earth is especially important given the rapid decline of many species, and this technology can recreate organisms in a way that has never been done before."

Irschick and colleagues plan to provide 3D models at no cost for creative or nonprofit use on an open access website. They believe the models will be valuable for educators, scientists and conservationists.

He notes that over the last several years, the field of digital photogrammetry, which integrates digital photographs into 3D models, has become increasingly used for digitally reconstructing architecture,

crimes scenes and for other applications. However, capturing the complex body shapes of living organisms has proven more challenging, as many animals exhibit a range of shapes and will rarely pose long for photographs.

The Beastcam Array has advanced the state of the art, Irschick says. It captures high-resolution images and with off-the-shelf software, can create 3D models of small animals. It can be scaled to smaller or larger sizes to scan a wide range of organisms.

Zachary Corriveau, a senior mechanical engineering major from Monson, Mass., who participated in the Beastcam research, says, "Our goal was to build a system that could be taken anywhere in the world."

Irschick says the team initially created the technology to create 3D models of Philippine skink lizards and similar animals, but they quickly realized the technology's broader value. Kasey Smart, a former mechanical engineering student from Shrewsbury, Mass., also involved in the research, adds, "We realized that this technology represented an opportunity to create 3D models of a wide range of living organisms, which had never been done before."

More information: www.digitallife3d.com/

Provided by University of Massachusetts Amherst