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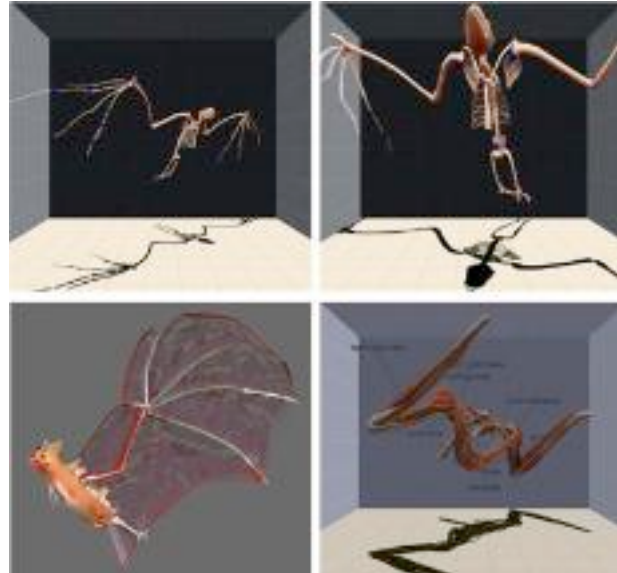
CSers develop new 3-D design tool

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Robert Zeleznik, David Laidlaw and Daniel Keefe - all members of Brown's Department of Computer Science - presented "Drawing on Air" in the September-October 2007 issue of the Institute of Electrical and Electronics Engineers's magazine Transactions on Visualization and Computer Graphics. Their device allows an artist to make precise 3-D designs with the help of a virtual reality mask, a stylus and a tracking device.

Daniel Keefe, a postdoctoral research associate focusing on scientific visualization, has been working on how to convey years of scientific data in one image. He said he hopes his work will bring artists and scientists together and that "Drawing on Air" is part of this process. "If we could have this ability to really draw things on air, it makes some new things possible," Keefe said.



Media Credit: Courtesy of Daniel Keefe
A team of Brown computer scientists has developed "Drawing on Air," a 3-D design tool.

Keefe emphasized the different applications for his invention - for artists, it allows zero gravity sculpting, and for scientists, it allows 3-D designing and "tele-operations," which could allow surgeons to practice their craft remotely.

Keefe said he predicts that this idea will be adopted by people from different disciplines and will become widely used and inexpensive in 10 to 15 years. "People will have these devices on their desks and go into 3-D design mode and start working on 3-D illustration of an idea, which they can drop it into a PDF document and send it out to friends," Keefe said.

After taking part in the development of "Cave Painting," the old model for 3-D drawing at the Cave Automatic Virtual Environment in 2001, Keefe worked on a specific problem - the difficulty for artists to control the lines they draw while experiencing virtual reality.

Since there is no surface to push against when drawing on air, it was only possible to draw loose gestural 3-D sculptures and sketches. However, for scientific visualization, a more precise drawing was needed.

With the help of grants from the National Science Foundation, Keefe and his colleagues adopted a more precise technique used by car designers called "tape drawing," which involves a thin electrical tape on one hand and 3-D device on the other, giving the artists more guidance.

Today's technological advancement makes exhibition of the designs possible. "These creations will not just be displayed in one space. They'll be displayed sometimes as 3-D printouts, sometimes as virtual worlds, sometimes as models at your desktop PC," Keefe said.