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Birdly allows users to embody a flying bird.

At SIGGRAPH 2014, the Emerging Technologies venue presented installations stemming from several fields, including displays, input devices, collaborative environments, robotics, haptics, and simulators. Of the 26 displayed installations at the conference (Vancouver, Canada, Aug. 10–14, 2014), we have selected the following four that highlight today's trends in technology and usage innovation.

🕯 Thierry Frey, SIGGRAPH 2014 Emerging Technologies Chair

DEMO HOUR

1. Birdly

Birdly is an installation that explores the experience of a bird in flight. It tries to capture the mediated flying experience with several methods. Unlike a common flight simulator, you do not control a machine—you embody a bird. To evoke this embodiment, we rely mainly on the sensory-motor coupling. The participant can control the simulator with his hands and arms, which directly correlate to the wings and primary feathers of a bird. The scenery is perceived in the first-person perspective of a bird. To intensify the embodiment, we include additional sonic, olfactory, tactile, and wind feedback.

🖥 http://birdly.zhdk.ch

▶ https://vimeo.com/91069214
https://vimeo.com/104858339
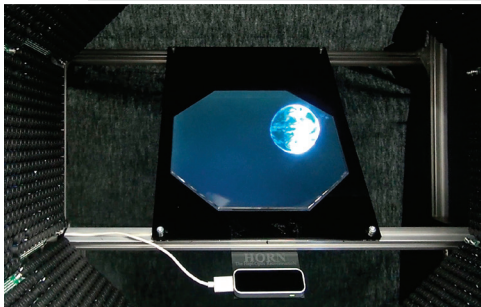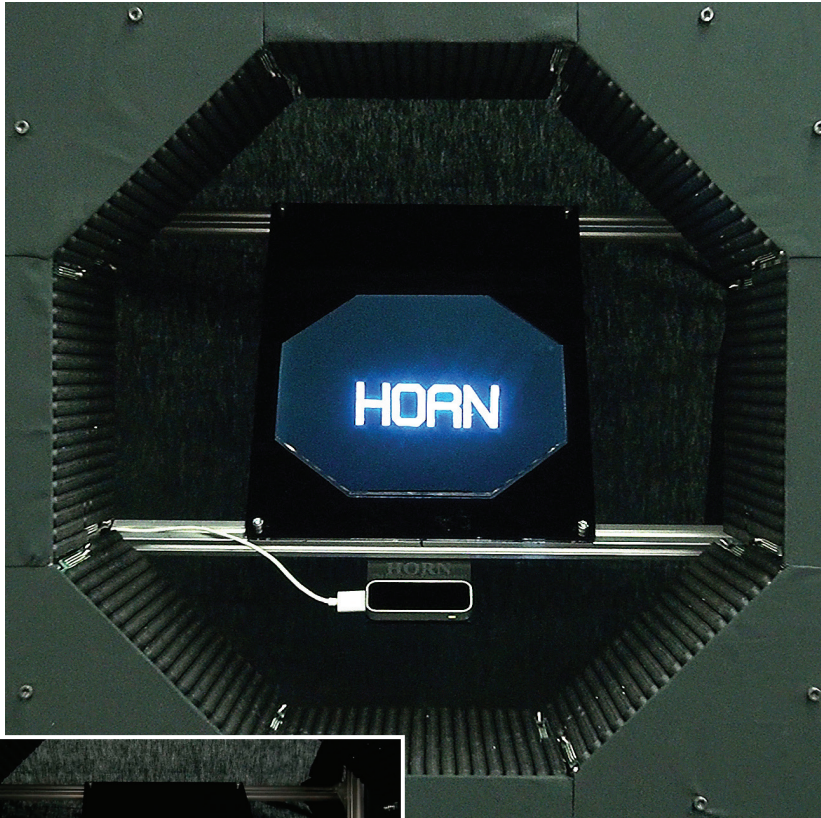
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2. HORN—Ultrasound Airborne Volumetric Haptic Display

Interaction with mid-air floating virtual objects expands human-computer interface possibilities. Here, we propose a system that superimposes haptic volumetric sensations on mid-air floating images by using acoustic potential distribution.

Our surrounding phased-array system freely produces 3D spatial patterns of ultrasonic standing waves, which create various feelings of elastic and textured surfaces. The ultrasound does not affect the optical images and can be controlled quickly in this interactive system. The combination of 3D volumetric vision and this haptic technology flexibly displays the presence of 3D objects that can be pinched, handled, and manipulated.

▢ http://www.hapis.k.u-tokyo.ac.jp/?portfolio=english-horn-hapt-optic-reconstruction&lang=en
▢ https://www.youtube.com/watch?v=7Ibdv0rtiDE
▢ Inoue, S., Kobayashi, K., Monnai, Y., Hasegawa, K., Makino, Y., and Shinoda, H. HORN: The hapt-optic reconstruction. *Proc. of SIGGRAPH 2014, Emerging Technologies.* ACM, New York, 2014, Article 11.

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3. MaD: Mapping by Demonstration for Continuous Sonification

MaD allows for simple and intuitive design of continuous sonic gestural interaction. When movement and sound examples are jointly recorded, the system automatically learns the motion-sound mapping. Our applications focus on using vocal sounds—recorded while performing actions—as the primary material for interaction design. The system integrates probabilistic models with hybrid sound synthesis. Importantly, the system operates independently

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of motion-sensing devices, and can be used with different sensors such as cameras, contact microphones, and inertial measurement units. Applications include not only performing arts and gaming but also medical applications such as auditory-aided rehabilitation.

- http://ismm.ircam.fr/siggraph2014-mad/
- http://vimeo.com/julesfrancoise/mad
- Françoise, J., Schnell, N., and Bevilacqua, F. A multimodal probabilistic model for gesture-based control of sound synthesis. *Proc. of the 21st ACM International Conference on Multimedia. ACM,* New York, 2013, 705–708. DOI:10.1145/2502081.2502184

- Françoise, J., Schnell, N., Borghesi, R., and Bevilacqua, F. Probabilistic models for designing motion and sound relationships. *Proc. of the 2014 International Conference on New Interfaces for Musical Expression.* 2014, 287–292.

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4. Cyberith Virtualizer

The Virtualizer is an easy-to-use virtual reality device that allows the user to walk through any kind of virtual environment in real time. It does so by combining a low-friction principle and high-precision sensors with a special mechanical construction, resulting in a new form of omni-directional treadmill.

- http:// www.cyberith.com
- https://www.youtube.com/watch?v=dVvYfonQJpk
- https://www.youtube.com/watch?v=bgblE3nxvNg

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