1
Floating screen with projection (showing a morpho butterfly) under the drone
(DJI Phantom 2; DJI Co., Ltd.).

1
The minimum weight
of the whole system is
around 600g (when we use
balsa wood for the frames).

8 DEMO HOUR

12 WHAT ARE YOU READING?

14 HOW WAS IT MADE?

16 DAY IN THE LAB

>
ENTER

The ACM Symposium on User Interface Software and Technology (UIST) is the premier forum for innovations in human-computer interfaces. The Symposium brings together people from diverse areas including tangible and ubiquitous computing, virtual and augmented reality, graphical and Web user interfaces, new input and output devices, and many other aspects of interactive systems. The intimate size and intensive program make UIST an ideal opportunity to exchange research results and ideas. We've selected four demos that we feel best exemplify the spirit of creativity and technology at UIST.

Chris Harrison and Yuta Sugiura, UIST 2016 Demo Committee Chairs

DEMO
HOUR

1. Gushed Diffusers: Fast-moving, Floating, and Lightweight Midair Display

Conventional aerial imaging systems are slow because they require a large, heavy setup. We use aerosol distribution from off-the-shelf spray as a fog screen that resists the wind and has high portability. As application examples, we present wearable applications and aerial imaging on objects with high-speed movements (e.g., a drone, a radio-controlled model car). Our study will contribute to the exploration of new application areas.

Suzuki, I., Yoshimitsu, S., Kawahara, K., Ito, N., Shinoda, A., Ishii, A., Yoshida, T., and Ochiai, Y. Gushed diffusers: Fast-moving, floating, and lightweight midair display. *Adjunct Proc. of the 29th Annual ACM Symposium on User Interface Software & Technology*. ACM, New York, 2016. DOI: <http://dx.doi.org/10.1145/2984751.2985706>

Suzuki, I., Yoshimitsu, S., Kawahara, K., Ito, N., Shinoda, A., Ishii, A., Yoshida, T., and Ochiai, Y. Gushed light field: Design method for aerosol-based fog display. *Proc. of SIGGRAPH Asia 2016 Emerging Technologies*. ACM, New York, 2016. DOI: <http://dx.doi.org/10.1145/2988240.2988244>

<http://digitalnature.slis.tsukuba.ac.jp/2016/08/glf/>

<https://youtu.be/EPyN003RljU>

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2
Top: entire prototype. Bottom:
(a) the prototype with convex
lenses and Fresnel lenses
(b) the prototype with only
convex lenses.

3
Wolverine, a new wearable haptic user
interface for grasping in virtual reality,
holding a cylinder-shaped virtual object.

2. Expanding the Field-of-View of Head-Mounted Displays with Peripheral Blurred Images

Field-of-view (FoV) is one of the key parameters of head-mounted displays (HMDs), because a wider FoV gives higher presence and immersion in a virtual environment. We propose a method that expands the FoV of HMDs by using two kinds of lenses with different levels of magnification. A central convex lens is surrounded by a Fresnel

lens with high magnification that fills the peripheral vision with a blurred image. This method doesn't need complicated optics, and is advantageous in terms of device cost and weight because only two additional Fresnel lenses are necessary.

■ Yamada, W. and Manabe, H. Expanding the field-of-view of head-mounted displays with peripheral blurred images. *Adjunct Proc. of the 29th Annual ACM Symposium on User Interface Software & Technology*. ACM, New York, 2016.
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3. Wolverine: A Wearable Haptic Interface for Grasping in Virtual Reality

The Wolverine is a mobile, wearable haptic device designed for simulating the grasping of rigid objects in virtual environments. We focused on creating a low-cost, lightweight device that renders a force directly between the thumb and three fingers to simulate objects held in pad-opposition-type grasps. Leveraging low-power brake-based locking sliders, the system can withstand over

100N of force between each finger and the thumb, and only consumes 2μWh for each braking interaction. Integrated sensors are used both for feedback control and user input: Time-of-flight sensors provide the distance of each finger and IMUs provide orientations.

■ Choi, I., Hawkes, E.W., Christensen, D.L., Ploch, C.J., and Follmer, S. Wolverine: A wearable haptic interface for grasping in virtual reality. *Proc. of IEEE/RSJ International Conference on Intelligent Robots and Systems*. IEEE, 2016.

■ Choi, I. and Follmer, S. Wolverine: A wearable haptic interface for grasping in VR. *Proc. of the 29th Annual ACM Symposium*

4

Example posing session of a bunny character, with a device consisting of four modular parts.

on User Interface Software & Technology. ACM, 2016.

<http://shape.stanford.edu>

<https://youtu.be/kgE7JwUuX4>

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4. Rig Animation with a Tangible and Modular Input Device

This demo presents a novel approach to digital character animation, combining the benefits of modular and tangible input devices and sophisticated rig animation algorithms. We overcome limitations inherent in all previous tangible devices using a symbiotic software and hardware approach. It allows users to directly control complex rigs with only 5 to 10 physical

modules. These compact input device configurations—optimized for a specific rig and a set of sample poses—are automatically generated by an algorithm. This avoids oversimplification of the pose space and excessively bulky devices.

Glauser, O., Ma, W.-C., Panozzo, D., Jacobson, A., Hilliges, O., and Sorkine-Hornung, O. Rig animation with a tangible and modular input device. *ACM Trans. Graph.* 35, 4 (2016); <http://dl.acm.org/citation.cfm?id=2925909>

<http://igl.ethz.ch/projects/rig-animation-input-device/>

<https://www.youtube.com/watch?v=QW-goz8Cx8U>

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