6 DEMO HOUR

11 WHAT ARE YOU READING?

12 HOW WAS IT MADE?

14 DAY IN THE LAB

ENTER

Interactivity is a unique forum of the ACM CHI Conference that showcases hands-on demonstrations, novel interactive technologies, and artistic installations. At CHI 2014, we aimed to create a “one of a CHIInd” Interactivity experience with more than 60 interactive exhibits to highlight the diverse group of computer scientists, sociologists, designers, psychologists, artists, and many more that make up the CHI community.

Julie Rico Williamson and Steven Benford, CHI Interactivity Chairs

DEMO
HOUR

1. GaussBricks

GaussBricks is a novel building-block system for tangible interaction design that enables real-time constructive tangible interactions on portable displays. The simple mechanical design of the magnetic building blocks facilitates the construction of configurable forms. The forms constructed from the magnetic building blocks, which are connected by magnetic joints, allow users to stably manipulate them with various elastic force-feedback mechanisms. With an analog Hall-sensor grid mounted to its back, a portable display determines the geometrical configuration and detects various user interactions in real time. This work also introduces several methods to enable actuated shape changing, multi-touch input, and display capabilities in the constructed form. The proposed building-block system enriches how individuals physically interact with portable displays.

<http://graphics.csie.ntu.edu.tw/~howieliang/GaussBricks.html>

<http://www.cmlab.csie.ntu.edu.tw/~howieliang/HCIProjects/projectGauss.html>

<https://www.youtube.com/watch?v=mtj0wSZbpZQ>

Liang, R-H, Chan, L., Tseng, H-Y, Kuo, H-C, Huang, D-Y, Yang, D-N, and Chen, B-Y. GaussBricks: Magnetic building blocks for constructive tangible interactions on portable displays. *Proc. of CHI 2014*. ACM, New York, 2014, 3153–3162.

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1
Basic building block designs support stable, configurable, and transparent physical-form construction.

2
Rainbowfish shows users supported gestures depending on the current state.

2. Rainbowfish

Gesture-based interaction methods are now supported by a wide variety of devices, such as capacitive trackpads and capacitive 3D gesture-recognition systems. When interacting with such proximity-sensing surfaces, users face the challenge that the supported gestures are not directly apparent. Rainbowfish tackles this problem by combining a semi-transparent capacitive proximity-sensing surface with an LED array. The LEDs are used to visually indicate possible gestural movements and provide feedback on the current interaction status. Aside from computer-centered interaction, Rainbowfish can be used as a low-cost gesture-recognition system for home automation, for example as a gesture-controllable door opener.

<http://www.opencapsense.org>

- 📺 <http://youtu.be/60xCyskivMc>
- 📺 Grosse-Puppenthal, T., Braun, A., Kamieth, F., and Kuijper, A. Swiss-cheese extended: An object recognition method for ubiquitous interfaces based on capacitive proximity sensing. *Proc. CHI 2013*. ACM, New York, 2013.
- 📺 Grosse-Puppenthal, T., Beck, S., Wilbers, D., Zeiss, S., von Wilmsdorff, J., and Kuijper, A. Ambient gesture-recognizing surfaces with visual feedback. *Proc. HCI'14*. Springer, 2014.

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3. TransWall

What would it be like to allow people to see each other through an interactive transparent display? We propose a concept called TransWall, which allows users to experience collocated face-to-face multimodal interactions through a transparent display. To implement this concept, we made a see-through display touchable on both sides and added more interaction possibilities, such as audio capabilities and vibrotactile feedback. TransWall enables people to see, hear, or even touch other people through the display while enjoying both the content and the interpersonal communication.

- 📺 <http://designmedia.kaist.ac.kr/>
- 📺 <https://vimeo.com/95255716>
- 📺 Heo, H., Park, H-K, Kim, S., Chung, J., Lee, G., and Lee, W.

Transwall: A transparent double-sided touch display facilitating collocated face-to-face interactions. *CHI 2014 Extended Abstracts*. ACM, New York, 2014, 435–438.
📺 Heo, H., Kim, S., Park, H., Chung, J., Lee, G., and Lee, W. TransWall. *ACM SIGGRAPH 2013 Emerging Technologies*. ACM, New York, 2013, Article 14.

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3

TransWall allows people to see, hear, and touch others through the display while interacting with display content.

4

Performers accompany themselves by pushing, leaning on, and bending steel wires.

4. The Vocal Chorder

Opera singers can use the Vocal Chorder, a large interactive instrument, to add new elements to their performance. The device allows performers to interactively accompany themselves through pushing, leaning on, and bending steel wires. Audience members can also use the instrument to interact with the operatic voice. When a person steps into the Vocal Chorder, its wires enable

full-body interaction to explore the sounds and the interactive pyramid projected in front of the performer. It is a visualization of the child in Ray Bradbury's short story "Tomorrow's Child," born in another dimension and perceivable by its parents only as a pyramid.

<http://www.electronic-opera.com/thevocalchorder>

<http://www.youtube.com/watch?v=oxUGb6rmFos>

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Unander-Scharin, A., Höök, K., and Elblaus, L. Interacting with the vocal chorder: Re-empowering the opera diva. *CHI 2014 Extended Abstracts*. ACM, New York, 2014, 603–606.

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