

CHI'15 Research

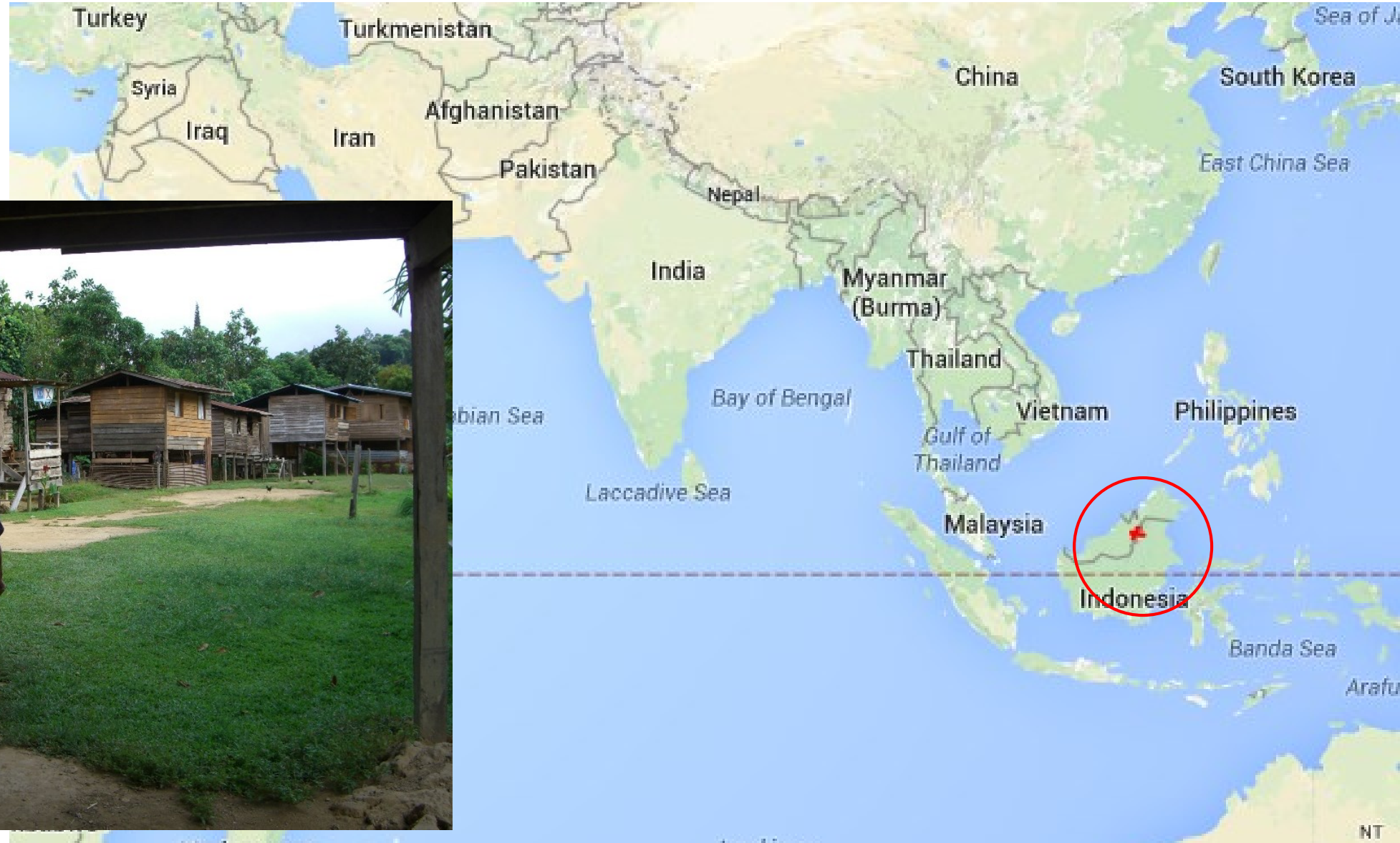
Overview

- ▶ New Interaction Tools for Preserving an Old Language
 - ▶ A paper by Plimmer et al presented at CHI 2015 (full presentation)
- ▶ Selected videos from CHI'15 papers and student competitions

New Interaction Tools for Preserving an Old Language

Beryl Plimmer, Liang He, Kasun Karunanayaka, Alvin W. Yeo,
Tariq Zaman, Garen Jengan, Rachel Blagojevic, Ellen Yi-Luen Do

Long Lamai, Borneo

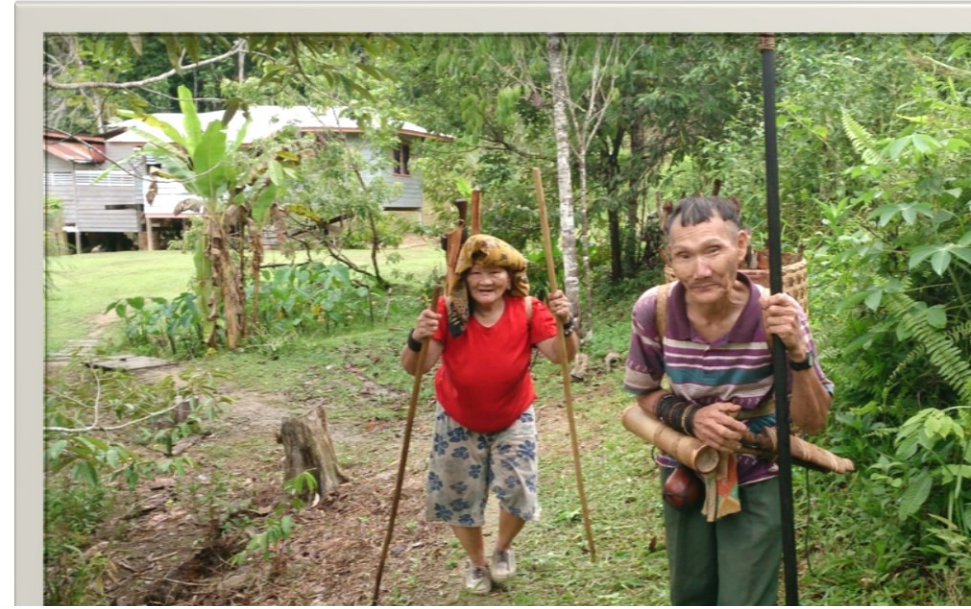


Access



Penan People

- Settled 1950s
- Self sufficient
 - Farming
 - Hunting (with blow pipe)
 - Boat and house building



21st Century Infrastructure

- ▶ Primary school and church
- ▶ Reticulated water
- ▶ Mini hydro
- ▶ Tele centre with its own solar power system
- ▶ 3G mobile (patchy)
- ▶ Internet via satellite (sometimes)

- ▶ NO road access to protect their land from illegal logging



But
Settlement and schooling

=

Loss of indigenous knowledge

- ▶ Language
- ▶ Bush craft
- ▶ etc

The Oroo' Language

- Object Language
- Natural Materials used as language tokens
- Arrangement carries the message



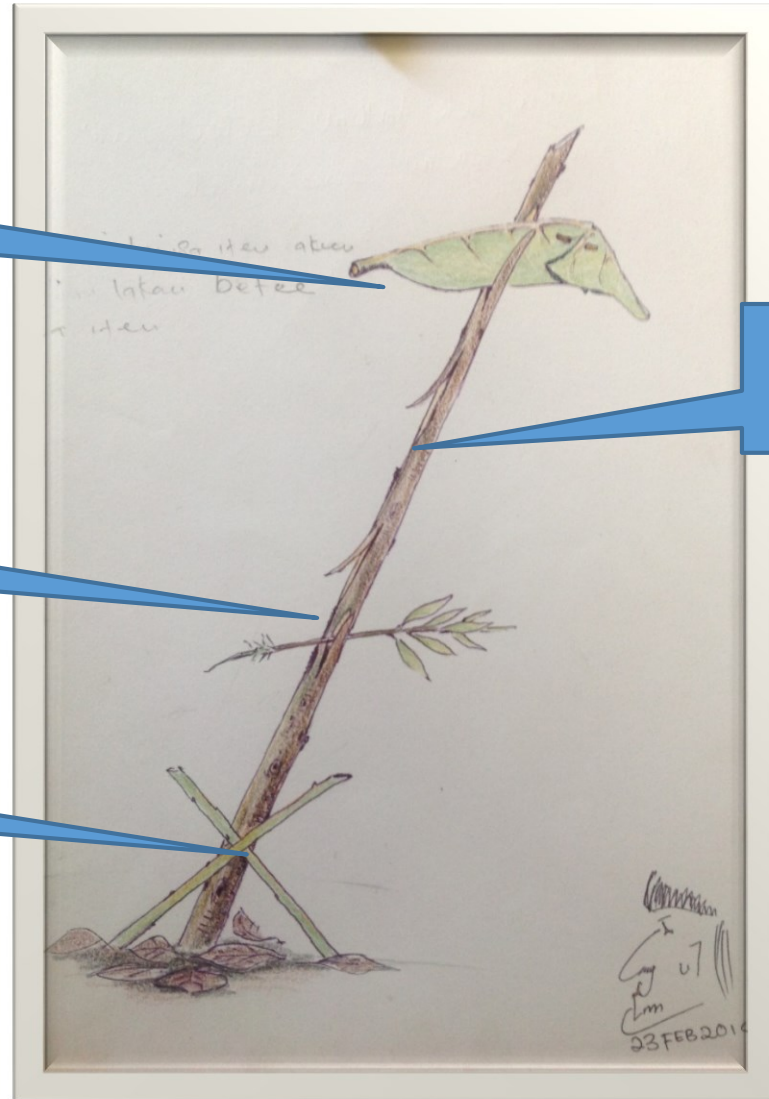
Oroo' Example

Hunting Boar
(wild pig)

I (one person)

Do not follow

In this
direction



Oroo' in the wild



Goal of this project

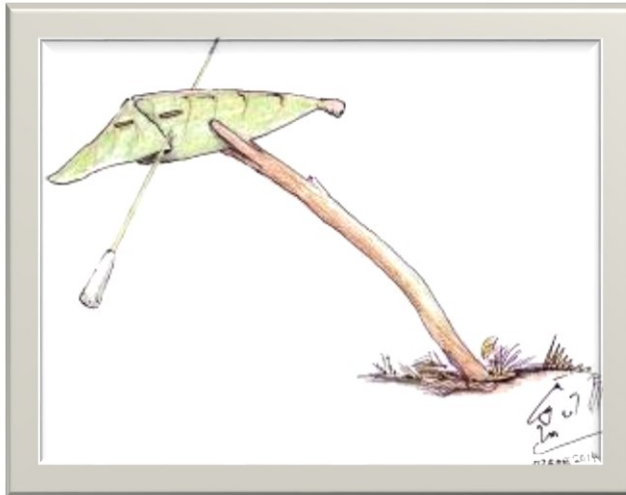
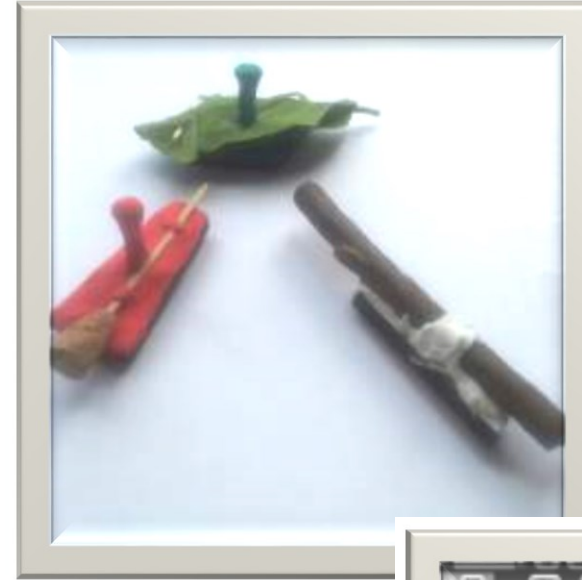
A software tool that will

- ▶ Assist with preserving and maintaining the Oroo' language;
 - ▶ by
- ▶ Being engaging for the old and young alike so people are motivated to use it;
- ▶ Encouraging intergenerational knowledge transfer by being an enjoyable collaborative environment

Tangibles



- Closeness of mapping



- Engaging
- Enjoyable



System Overview



Tap



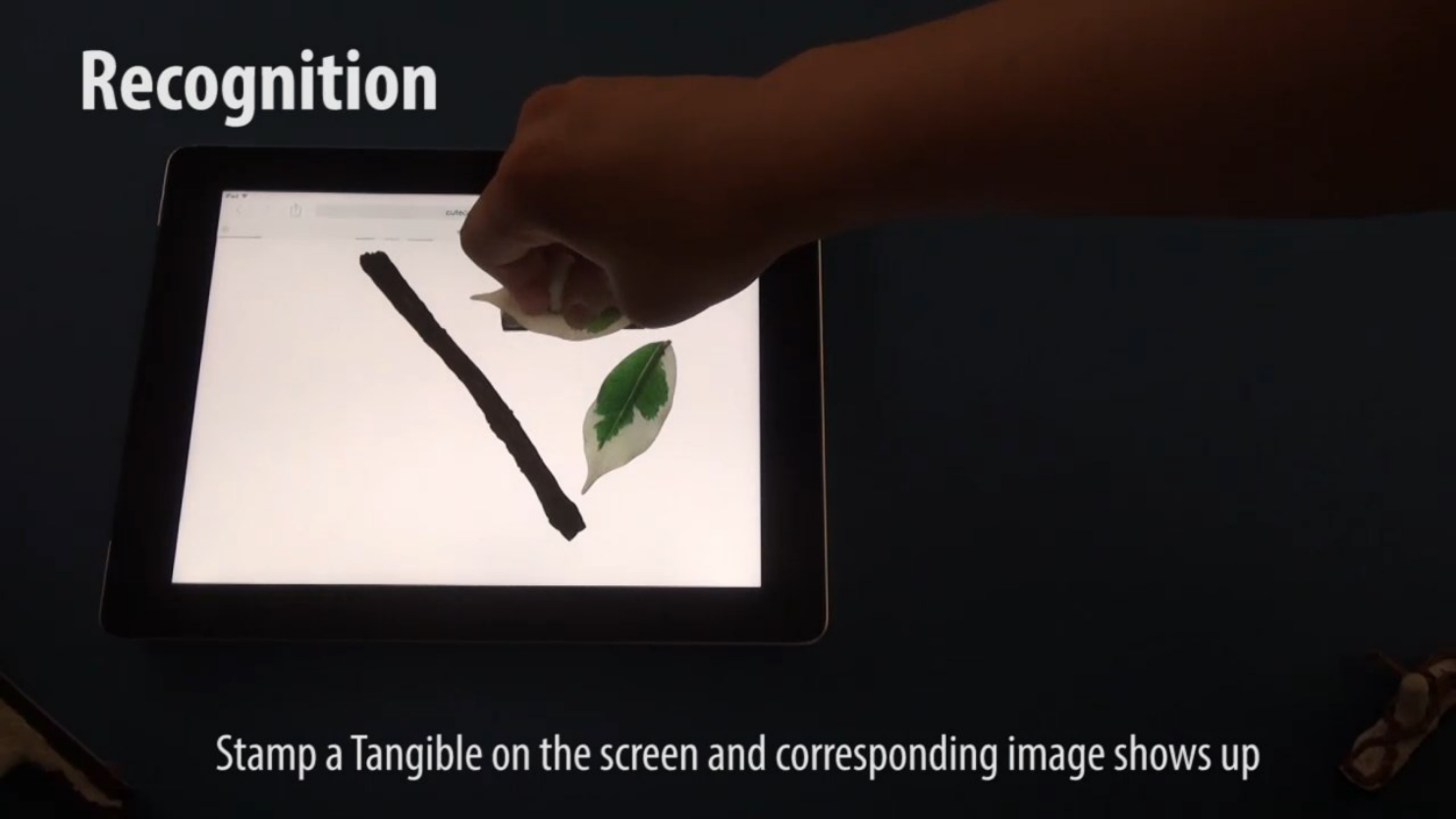
Move



Rotate



Delete

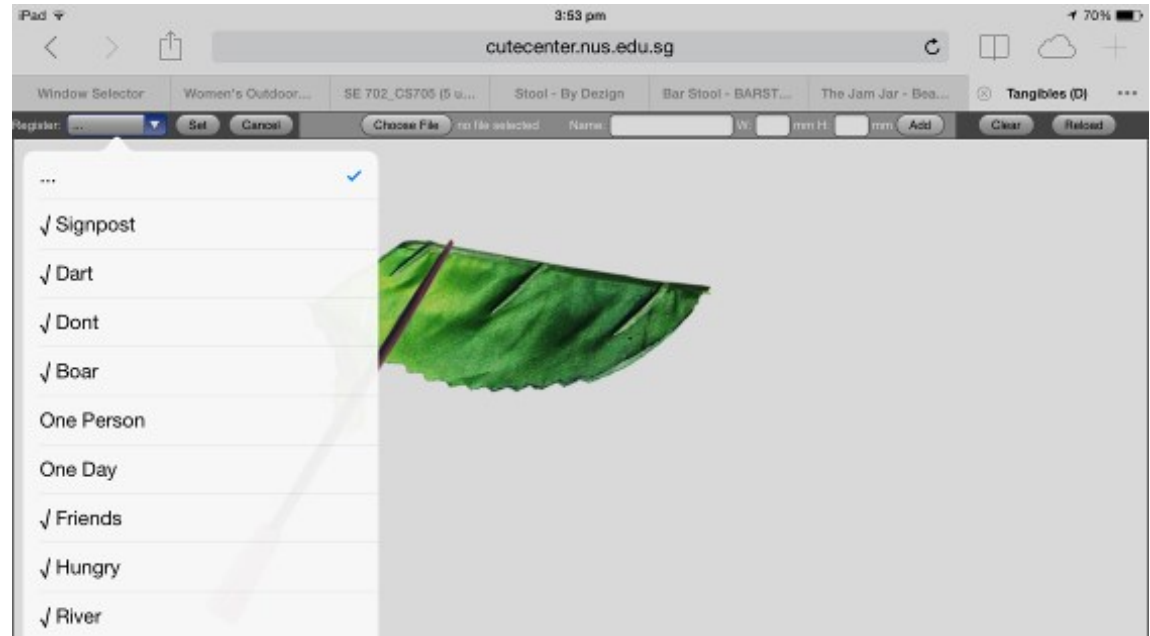


Making Tangibles



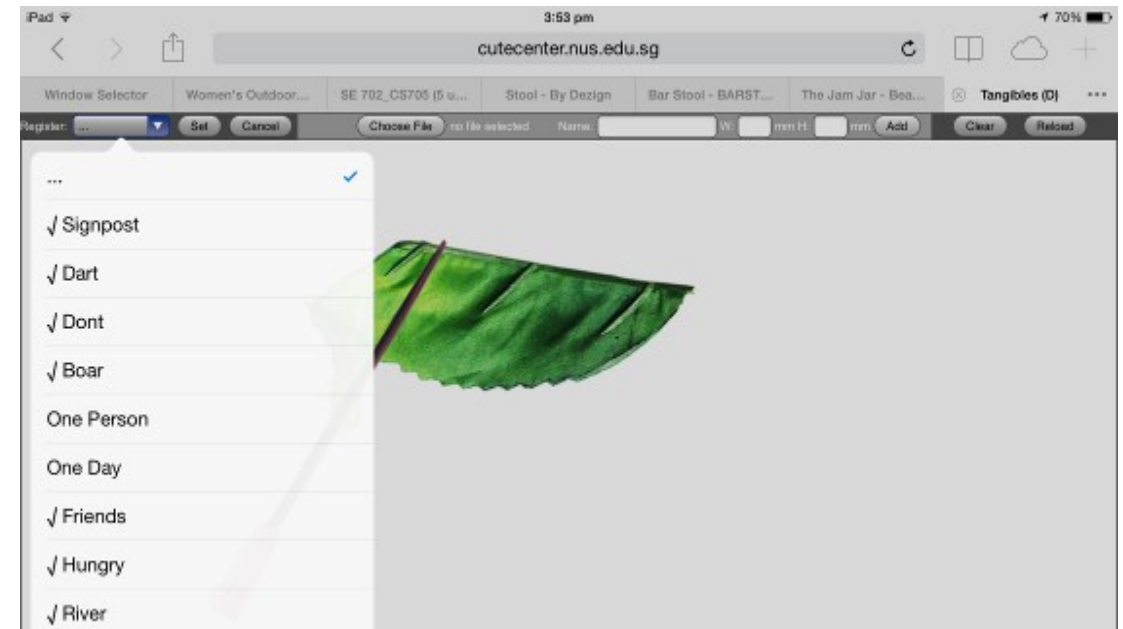
Technology

- ▶ Capacitive Tablets
 - ▶ Safari or Chrome
- ▶ HTML5 (KineticJS)
- ▶ JavaScript Database



Recognition

- ▶ 3 point triangulation
 - ▶ Irregular triangle of touch points
- ▶ Register Tangible
 - ▶ Make symbol and photograph
 - ▶ Add image to system
 - ▶ Attach symbol to base
 - ▶ Register tangible to image
- ▶ Recognize
 - ▶ Match tangible to image
 - ▶ Display image at correct place and orientation



Prototype Iterations

- ▶ Prototype 1.
 - ▶ Three elders individually
- ▶ Prototype 2.
 - ▶ Group of 3 elders
 - ▶ A family group
 - ▶ Community meeting
- ▶ Prototype 3.
 - ▶ Six family groups

First Round

Pseudo Oroo'



Results

- ▶ Magic
- ▶ Needed realistic Ooro'

- ▶ Two participants made a new tangible
 - ▶ They were not too sure about that.



Flower made into tangible and used to make a bunch of flowers

Second Prototype

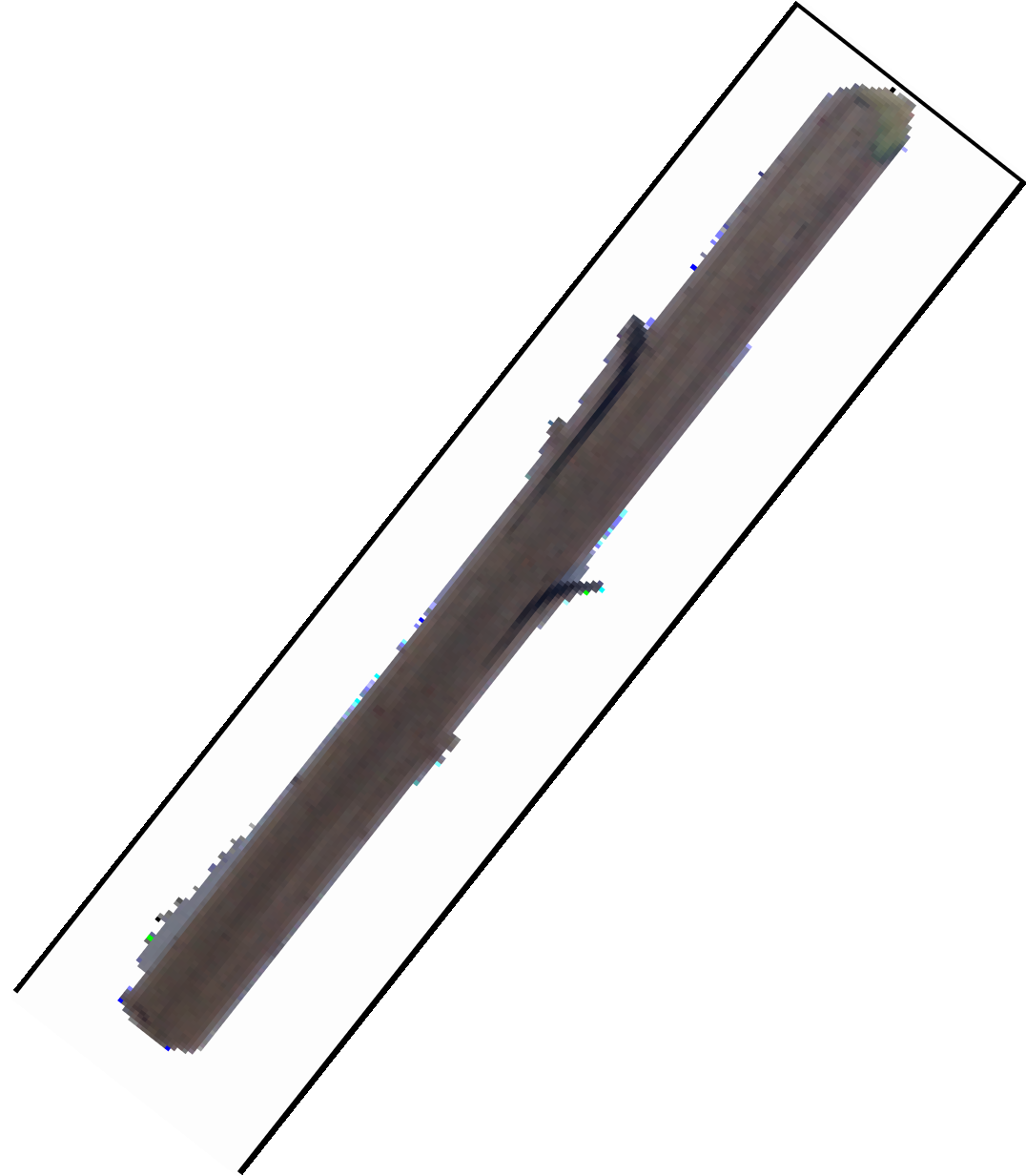
- ▶ New objects
 - ▶ Boar
 - ▶ Signpost
 - ▶ Don't
 - ▶ 3 days
 - ▶ Dart (kill)
- ▶ 3 Elders together
- ▶ Family
- ▶ Community meeting



Results - 3 Elders

- **Magic?**
- **New information about the language**
- **Not keen on making their own**

Define a set of basic objects (10-12)



Family

- **Fun**
- **Collaboration**
- **Knowledge transfer
(both ways)**

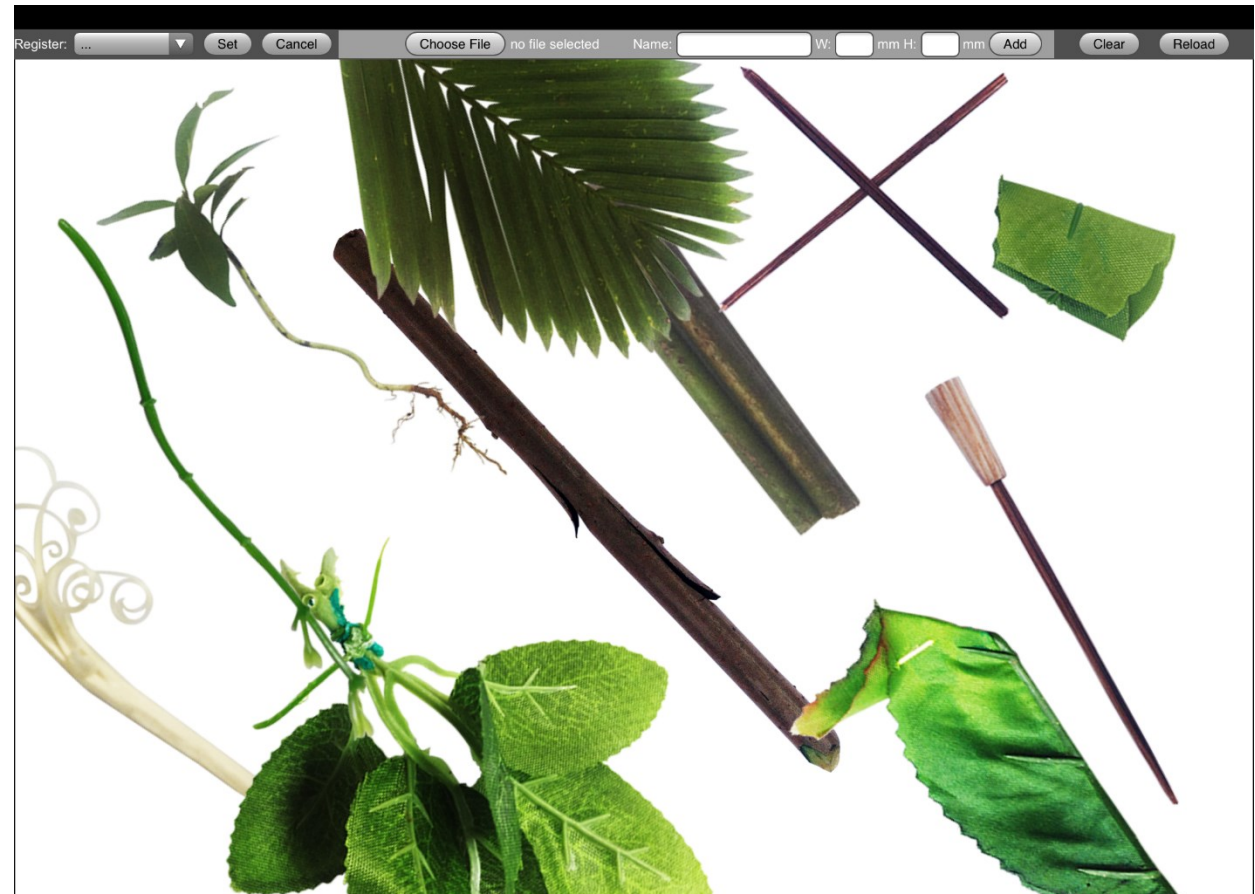


Community Meeting

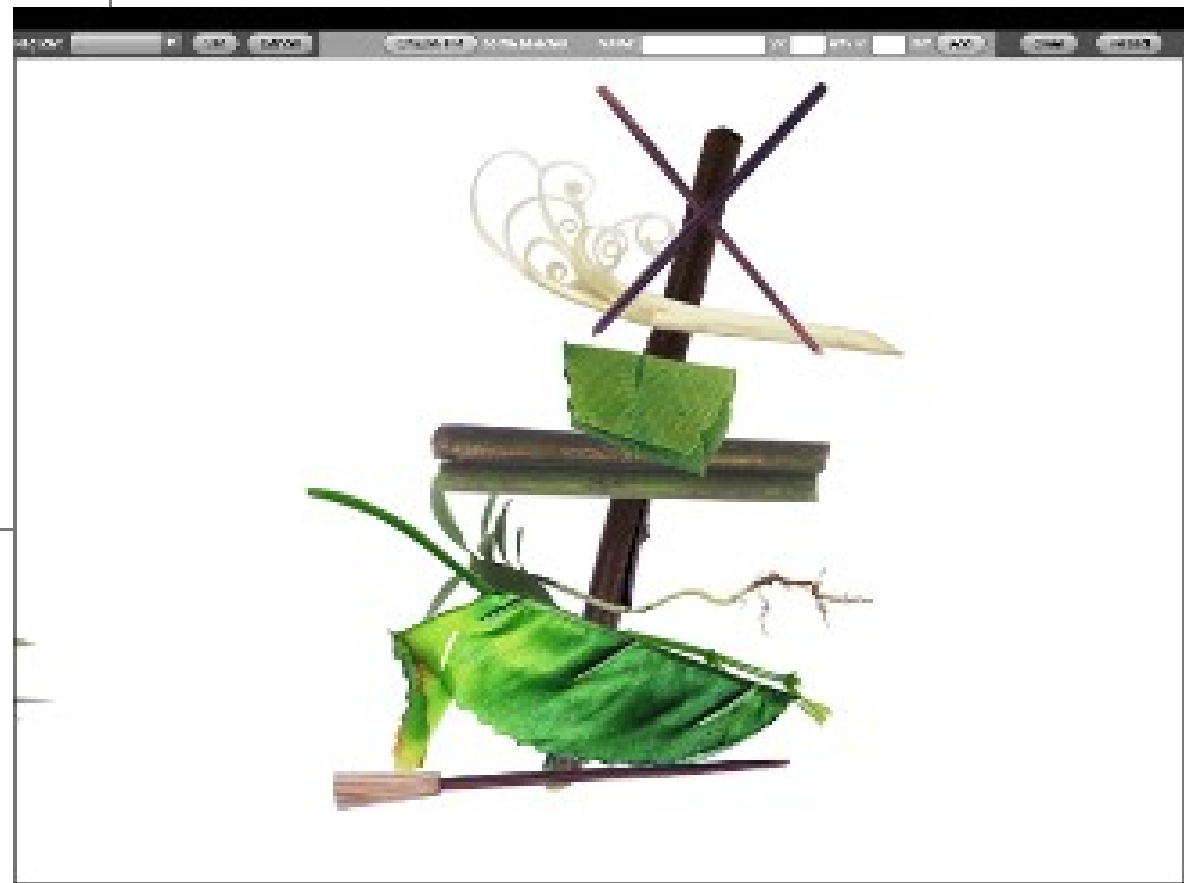


Third prototype

- ▶ Add two-finger rotate
- ▶ Simply recognizer
 - ▶ Current one is more complex than required and error prone
- ▶ Add new default object set



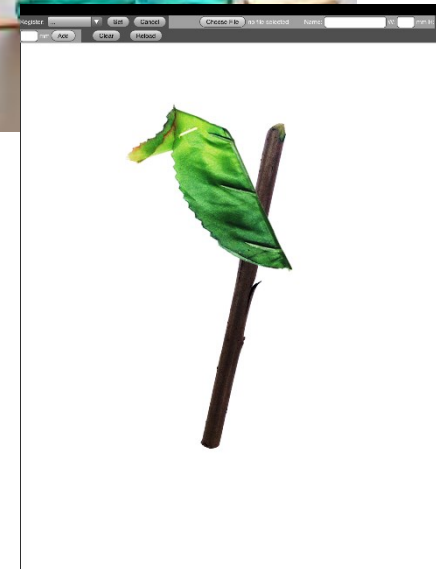




Participant	Gender	Age	Symbols identified	
			Pre-test	Post-test
G1C	M	8	0	9
G2C	M	7	0	6
G3C	F	8	2	5
G4C	M	8	0	8
G5C	M	12	0	10
G6C	F	16	0	10
Mean			0.33	8

Key Points

- ▶ Closeness of mapping between
 - ▶ Oroo'
 - ▶ Tangibles
 - ▶ Images
- ▶ Clean, non-modal interactions
- ▶ Ease of construction of tangibles
- ▶ Ease of adding new tangibles to the system
- ▶ Uncovering of language constructs



Enchantment

- ▶ Enchantment of touch screens and tangibles





- ▶ Thanks to
- ▶ co-authors: (Beryl Plimmer), Liang He, Tariq Zaman, Kasun Karunanayaka, Alvin W. Yeo, Garen Jengan, Rachel Blagojevic, Ellen Yi-Luen Do
- ▶ Long Lamai Village
- ▶ Funding agencies listed in paper

The village



Chi - chi2015.acm.org

- ▶ CHI '15 1520 submitted papers 379 accepted
- ▶ 4 days
- ▶ 15 parallel sessions in each time slot
- ▶ 3000 attendees

- ▶ Full papers
- ▶ Tech notes
- ▶ Work in progress
- ▶ Student design and game competitions
- ▶ Panel discussions
- ▶ And more

- ▶ All available on ACM DL - access through the library/[databases/acm dl](http://dl.acm.org)

ShapeClip



Towards Rapid Prototyping with
Shape-Changing Displays for
Designers

“Turn any display into a shape-changing display”

John Hardy, Christian Weichel, Faisal Taher, John Vidler, Jason Alexander



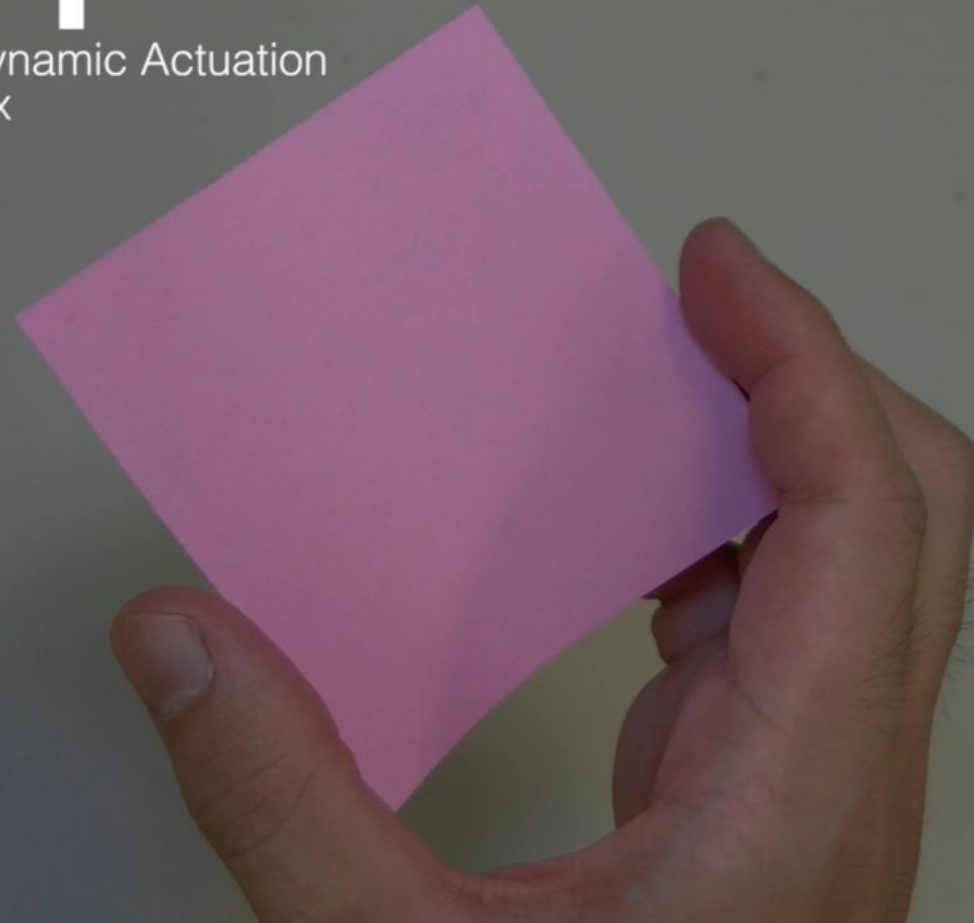
Hardy, J., Weichel, C., Taher, F., Vidler, J., & Alexander, J. (2015, April). ShapeClip: towards rapid prototyping with shape-changing displays for designers. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems* (pp. 19-28). ACM.

FluxPaper

Reinventing Paper with Dynamic Actuation
Powered by Magnetic Flux

Masa OGATA
Keio University

Masaaki FUKUMOTO
Microsoft Research

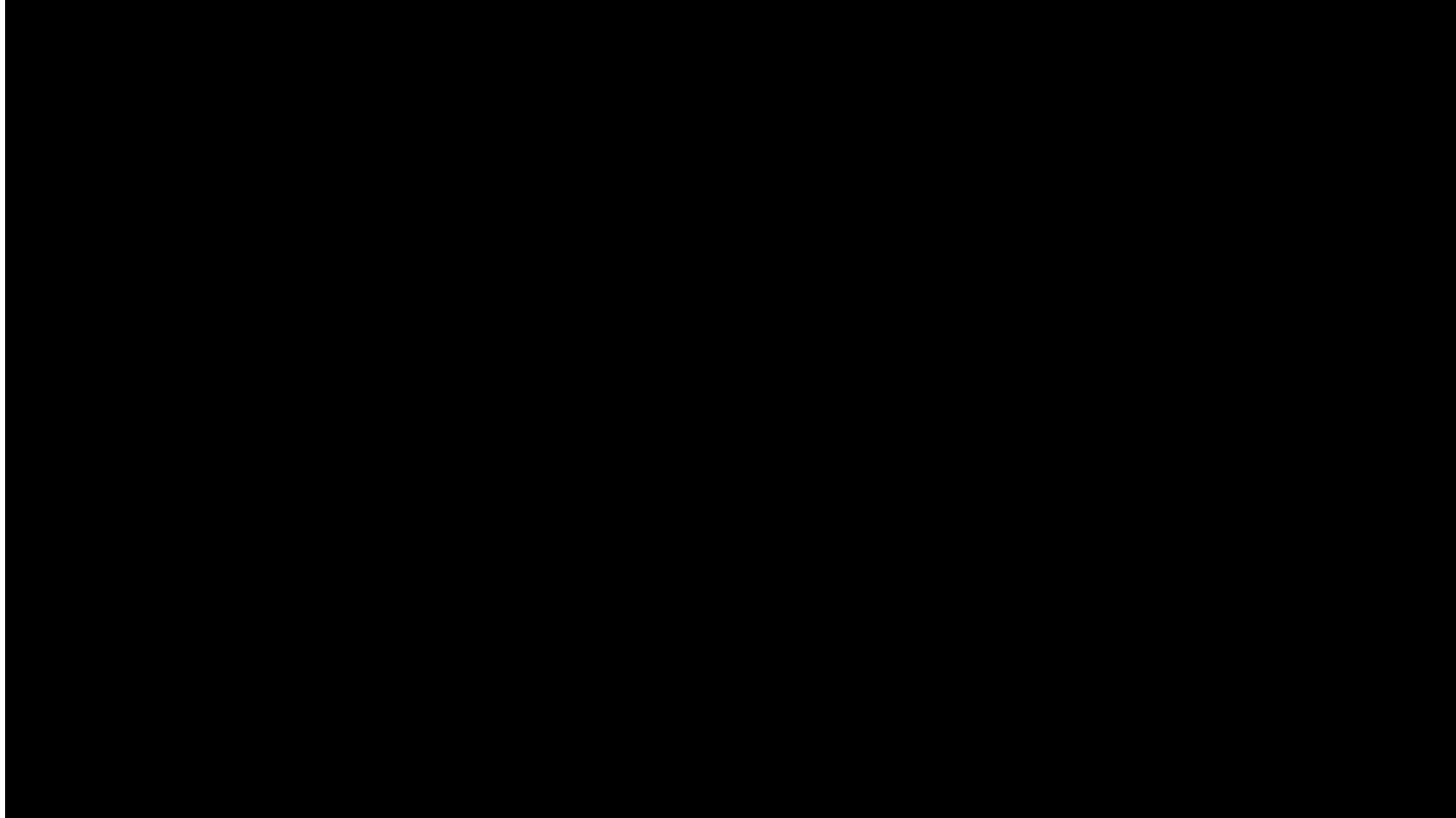


Ogata, M., & Fukumoto, M. (2015, April). FluxPaper: Reinventing Paper with Dynamic Actuation Powered by Magnetic Flux. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems* (pp. 29-38). ACM.

Dancing paper (not from chi)

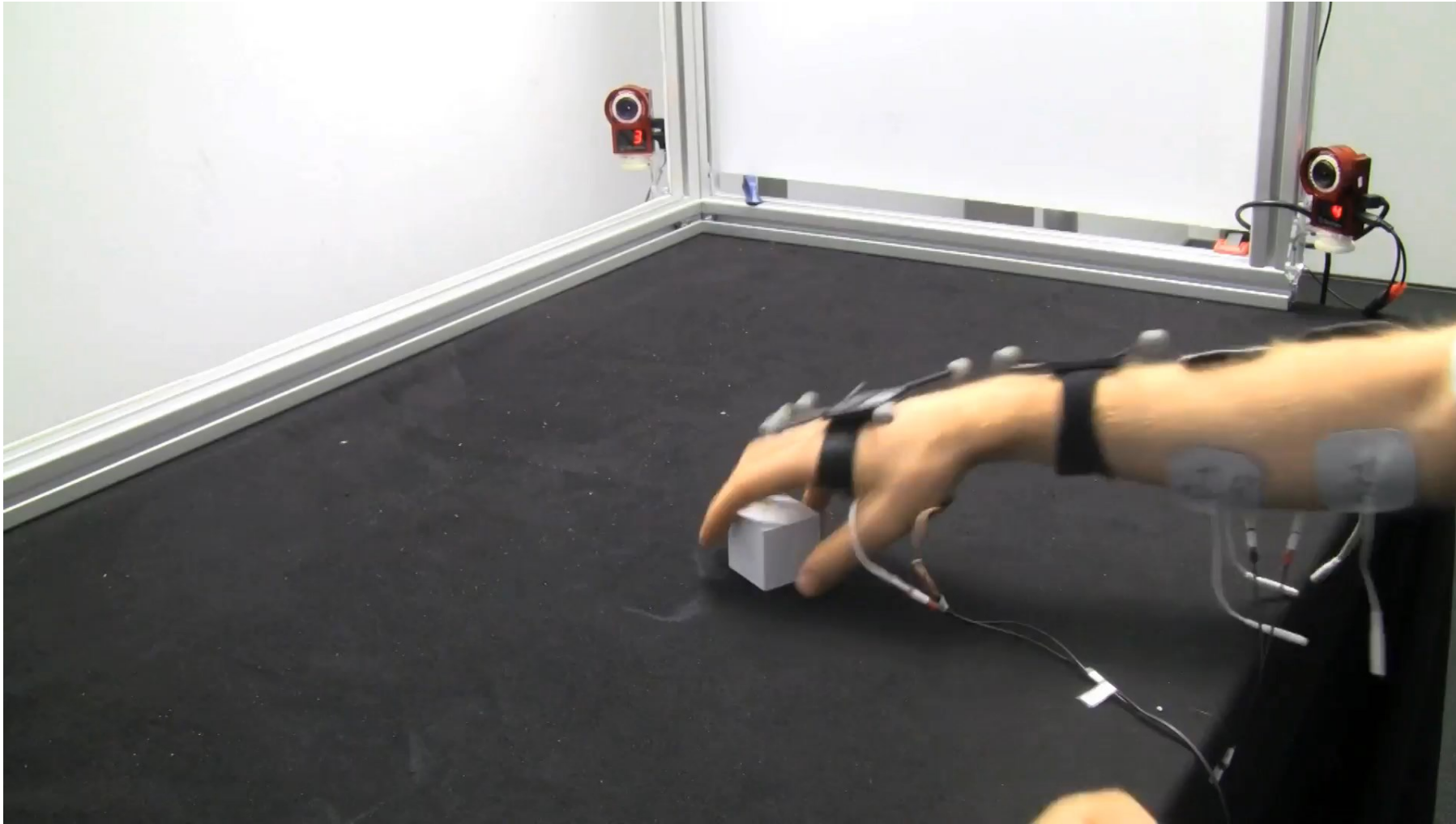


BodyVis



Norooz, L., Mauriello, M. L., Jorgensen, A., McNally, B., & Froehlich, J. E. (2015, April). BodyVis: A New Approach to Body Learning Through Wearable Sensing and Visualization. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems* (pp. 1025-1034). ACM.

Slightly creepy



Lopes, P., Jonell, P., & Baudisch, P. (2015, April). Affordance++: allowing objects to communicate dynamic use. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems* (pp. 2515-2524). ACM.

And more - same group



Lopes, P., Ion, A., Müller, W., Hoffmann, D., Jonell, P., & Baudisch, P. (2015, April). Proprioceptive Interaction. In *Proceedings of the 33rd Annual ACM Conference Extended Abstracts on Human Factors in Computing Systems* (pp. 175-175). ACM.

BaseLase

An Interactive Focus+Context Laser Floor



Jörg Müller^{1,2}

Dieter Eberle¹

Constantin Schmidt¹

¹ Quality and Usability Lab, Telekom Innovation Laboratories, TU Berlin, Germany

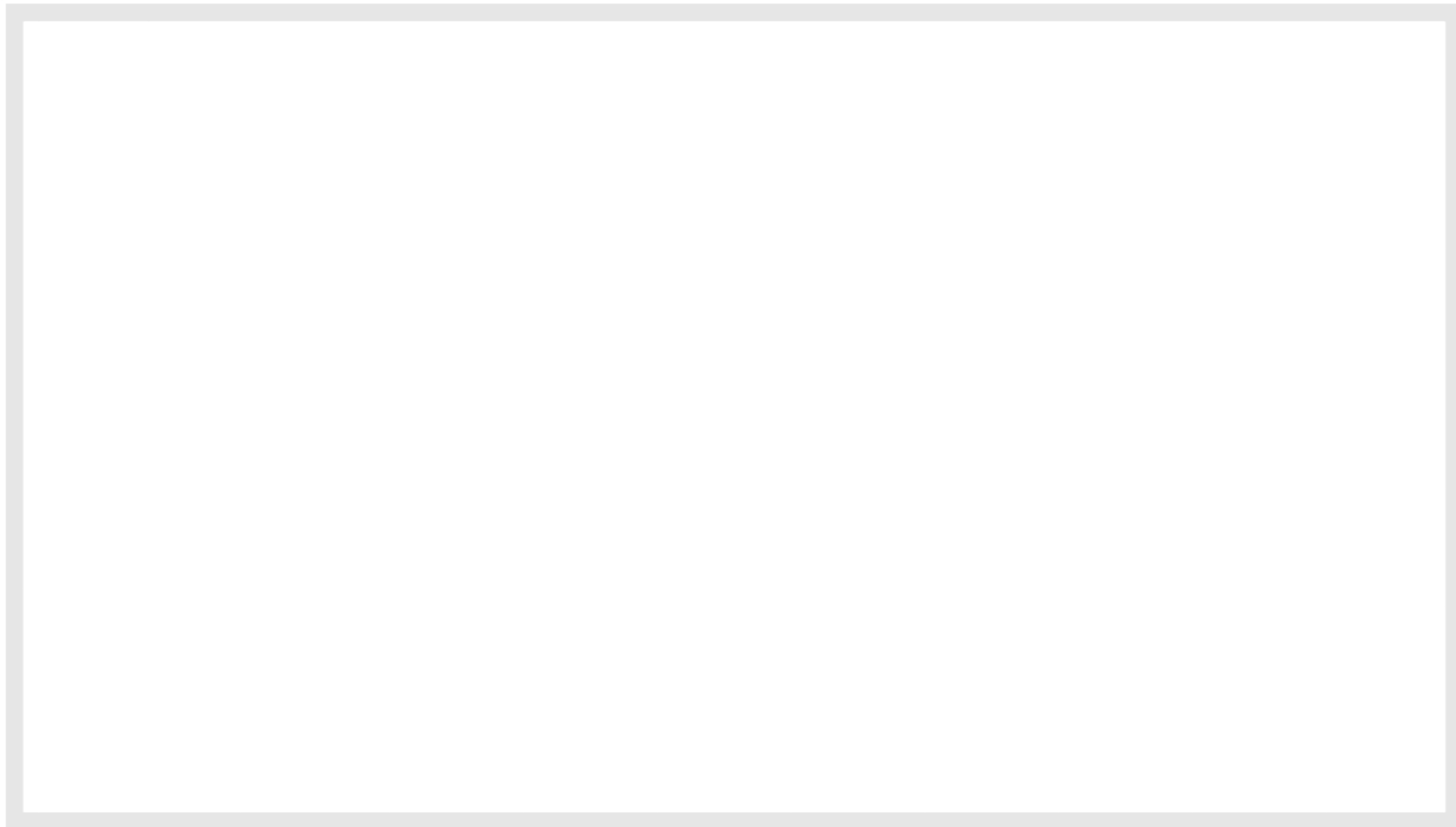
² Department of Computer Science, Aarhus University, Aarhus, Denmark

Müller, J., Eberle, D., & Schmidt, C. BaseLase: An Interactive Focus+ Context Laser Floor.

Lightweight Relief Shearing for Enhanced Terrain Perception on Interactive Maps

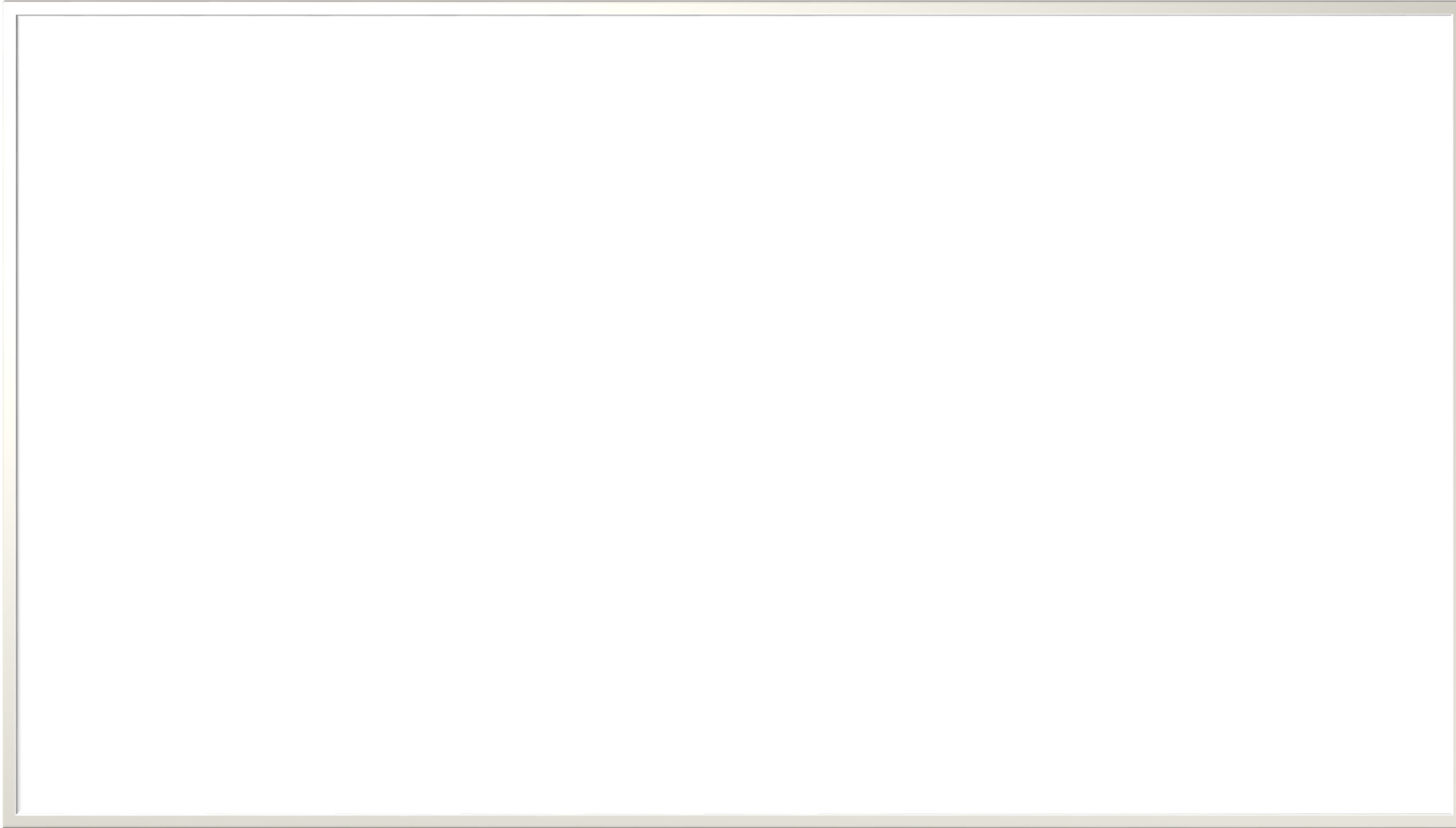
Wesley Willett Inria / University of Calgary
Bernhard Jenny Oregon State University
Tobias Isenberg Inria
Pierre Dragicevic Inria

Willett, W., Jenny, B., Isenberg, T., & Dragicevic, P. (2015, April). Lightweight Relief Shearing for Enhanced Terrain Perception on Interactive Maps. In *Proceedings of the 33rd ACM Conference on Human Factors in Computing Systems (CHI 2015)*.

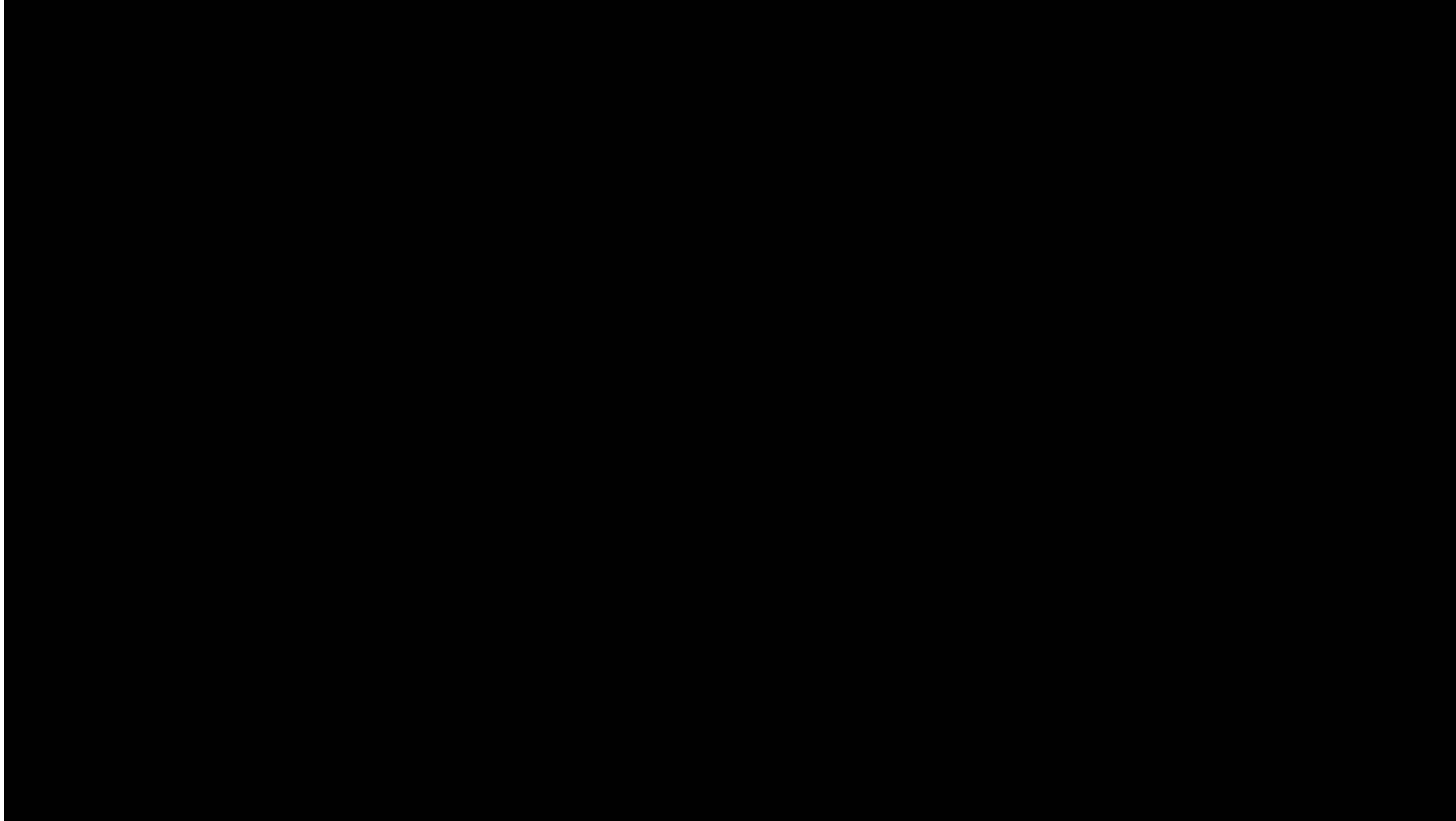


Bachynskyi, M., Palmas, G., Oulasvirta, A., Steimle, J., & Weinkauf, T. (2015, April). Performance and Ergonomics of Touch Surfaces: A Comparative Study using Biomechanical Simulation. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems* (pp. 1817-1826). ACM.

Student Design Competition



Chen, H. E., Lin, Y. Y., Chen, C. H., & Wang, I. (2015, April). BlindNavi: A Navigation App for the Visually Impaired Smartphone User. In *Proceedings of the 33rd Annual ACM Conference Extended Abstracts on Human Factors in Computing Systems* (pp. 19-24). ACM.



Baranoff, J., Gonzales, R. I., Liu, J., Yang, H., & Zheng, J. (2015, April). Lantern: Empowering Refugees Through Community-Generated Guidance Using Near Field Communication. In *Proceedings of the 33rd Annual ACM Conference Extended Abstracts on Human Factors in Computing Systems* (pp. 7-12). ACM.

Student Games competition



Bala, P., Noóbreaga, L., Neves, G., Lopes, L. S., Morna, J., Camacho, J., & Freitas, C. (2015, April).
Keyewai: Looking at Cooperation in a Holographic Projection Screen. In *Proceedings of the 33rd Annual ACM Conference Extended Abstracts on Human Factors in Computing Systems* (pp. 61-64). ACM.