

Smell HCI From a Thousand Miles Away: A Tasting Menu of Human-Computer Interaction

ALICE SEMINAR @ShanghaiTech



Chenyang Zhang

2nd year HCC PhD @GT chenyang.zhang@gatech.edu chenyang.me

AR/VR User Interface • Immersive Experience • Spatial Computing



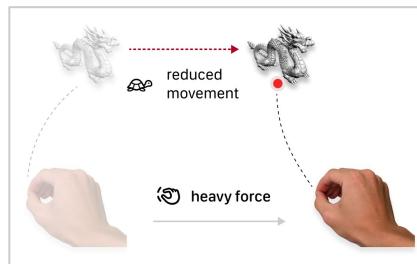
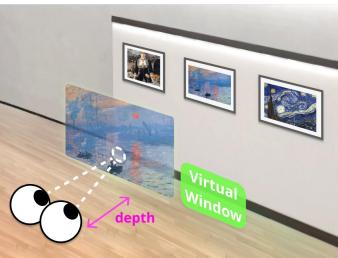
IVI.Lab



Empowering everyone to create, share, and shape their own immersive experiences.



Low-Level Interaction Techniques



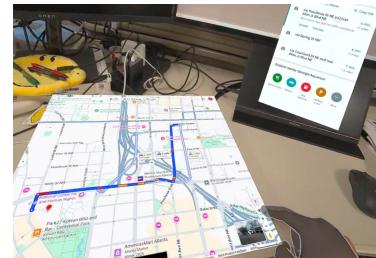
Gaze

FocusFlow: 3D Gaze Depth Interaction

Gesture

ForcePinch: Force-Responsive Spatial Interaction

High-Level Interaction Applications



Productivity

Blending virtual elements with the physical environment

Sharing

Telepresence, Communication, and Collaboration in 3D Space

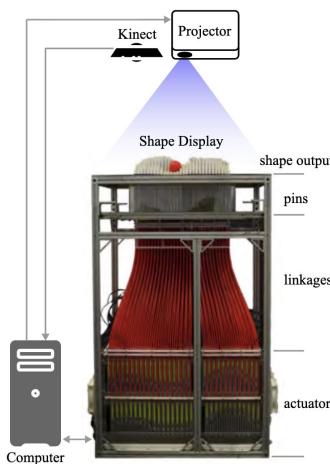
What is Human-Computer Interaction (HCI)?

- A surprisingly hard question :((
- So let's look at a few examples to get a sense :)))





Figure 1: inFORM enables new interaction techniques for shape-changing UIs. *Left to right:* On-demand UI elements through *Dynamic Affordances*; Guiding interaction with *Dynamic Constraints*; Object actuation; Physical rendering of content and UI.



Dynamic & Programmable Physical Affordances

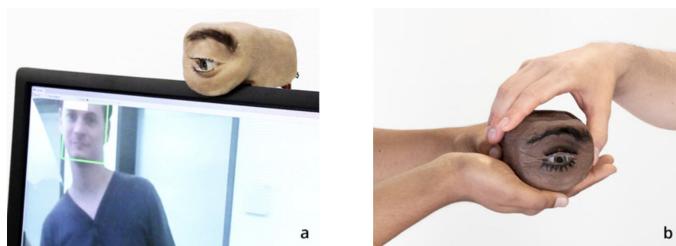
Embodied Interaction & Tactile Cognition

Interface Agency





Figure 1: a) *Eyecam* is an alternative anthropomorphic design of conventional webcams, b) which draws inspiration from the human eye morphology to c) exaggerate the sensing capacities of webcams like face detection, and d) foster affective relationships.



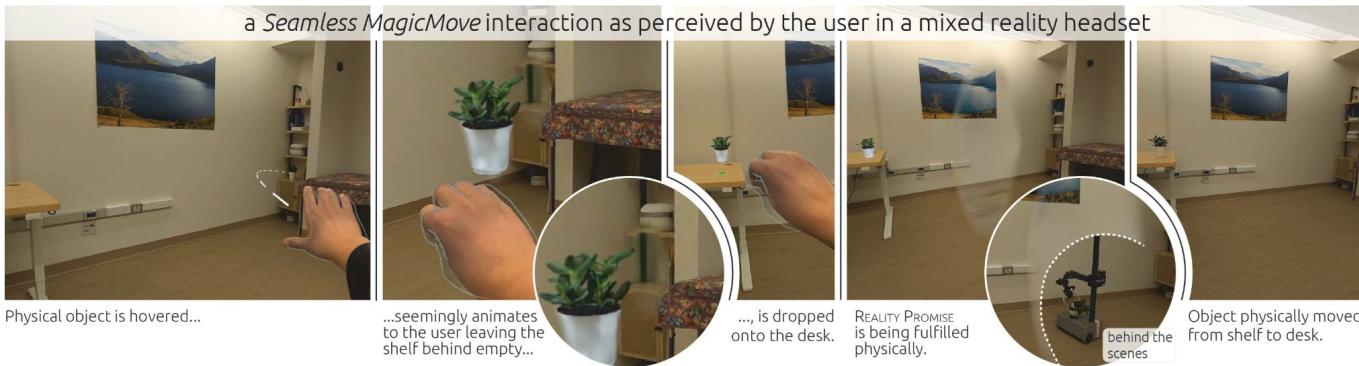
Critical & Speculative Design

Anthropomorphic Affordances



Sensor Visibility & Privacy Awareness

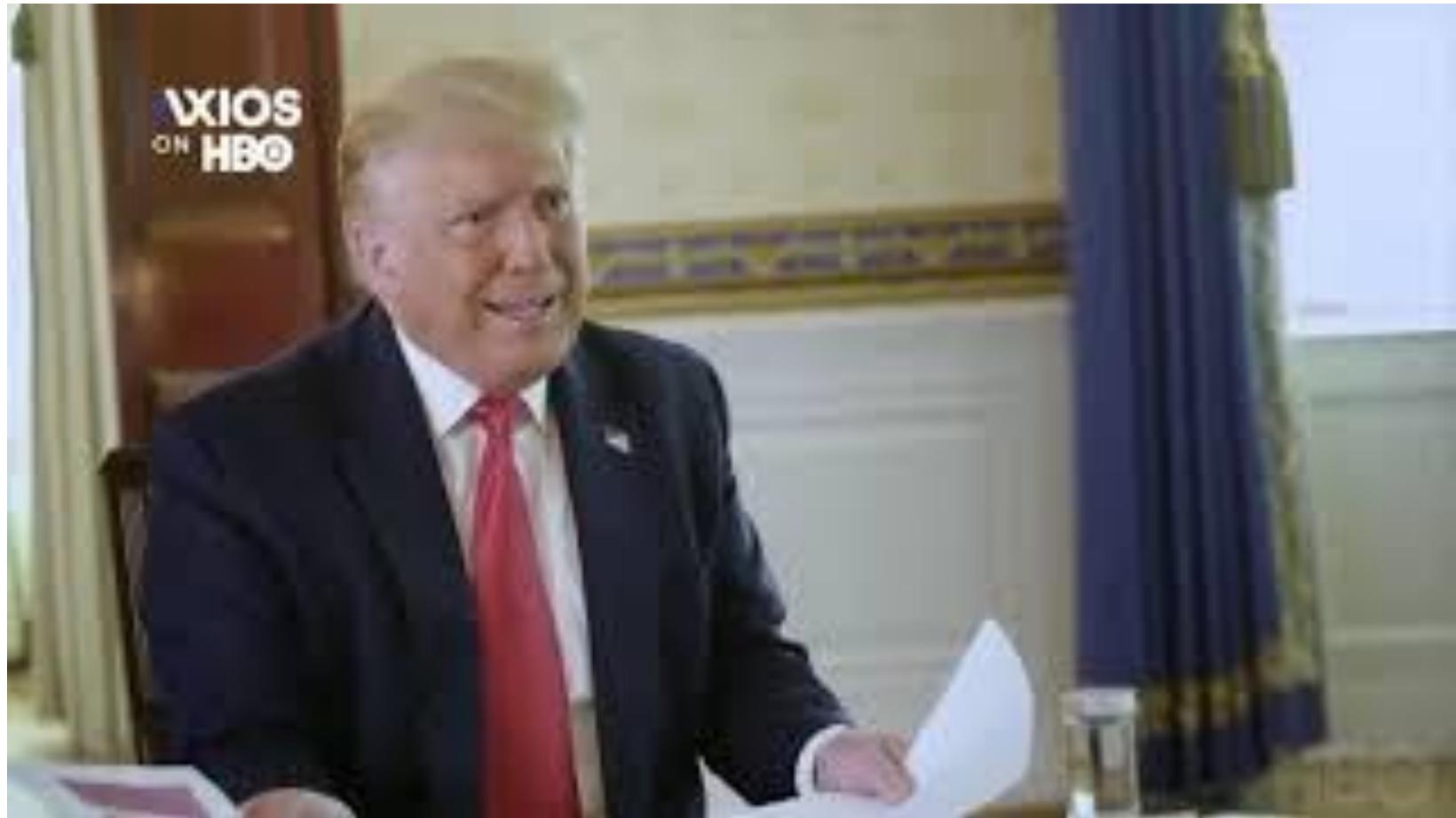




Virtual-Physical Decoupling Illusions

Invisible Robot Infrastructure

Mixed Reality with Physical Consequences



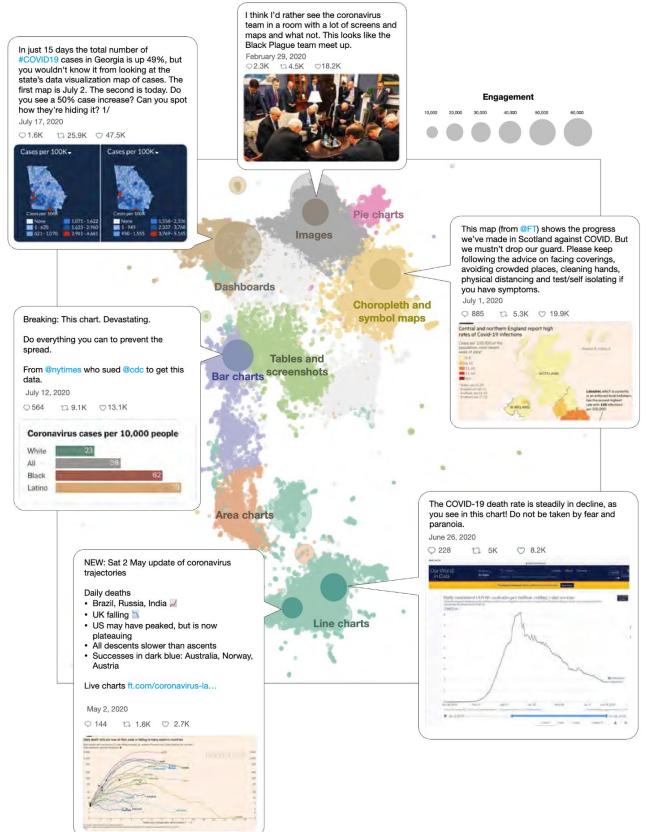


Figure 1: A UMAP visualization of feature embeddings of media found in our Twitter corpus. Color encodes labeled clusters, and size encodes the amount of engagement the media received (i.e., the sum of replies, favorites, retweets, and quote tweets).

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Visualization as Social Practice

Data Literacy vs. Misinformation

Participatory Misuse of Data

Power, Persuasion, and Visual Evidence

The figure displays three screenshots of a mobile application interface, illustrating a generative and malleable user interface design.

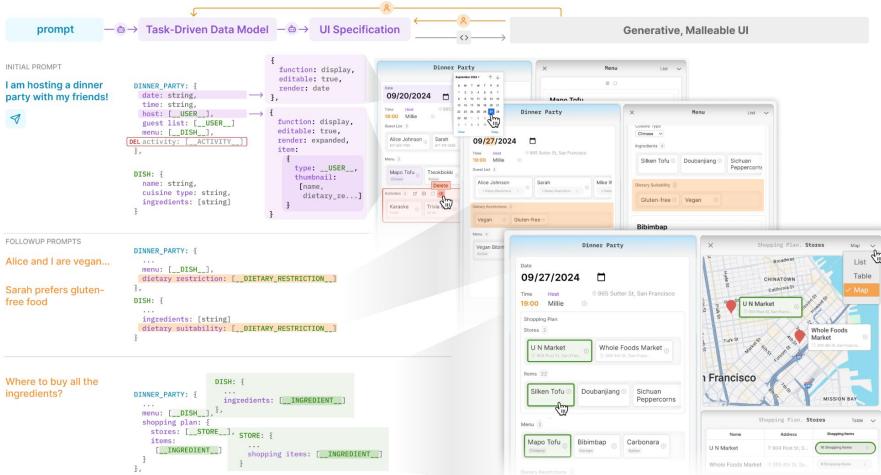
Screenshot 1: Delivery Party
A card-based interface for entering delivery details. It includes fields for "Delivery Party" (with placeholder "John & friend"), "Delivery Address" (placeholder "123 Main St, San Francisco, CA 94103"), and "Delivery Date" (placeholder "2025-01-01"). A "Next" button is at the bottom right.

Screenshot 2: Delivery Party
A card-based interface for selecting delivery details. It shows a summary of the delivery party ("John & friend") and address ("123 Main St, San Francisco, CA 94103"). It lists "Shipping Date" (placeholder "2025-01-01") and "Shipping Time" (placeholder "10:00 AM"). Below these are sections for "Delivery Address" (placeholder "123 Main St, San Francisco, CA 94103") and "Delivery Details" (placeholder "10:00 AM"). A "Next" button is at the bottom right.

Screenshot 3: Map View
A map of San Francisco showing delivery routes. It highlights two delivery points: "John & friend" (marked with a red pin) and "Sarah's Organic Market" (marked with a green pin). The map includes street names like "Market St" and "Castro". A "Get Directions" button is located in the bottom right corner of the map area.

Annotations:

- A yellow arrow points from the text "I am hosting a dinner party with my friend" to the "Delivery Party" field in Screenshot 1.
- A yellow arrow points from the text "Where to buy all the ingredients?" to the "Shipping Date" field in Screenshot 2.



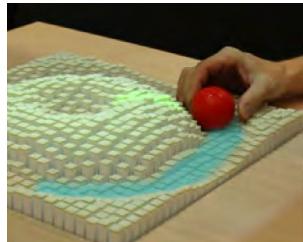
AI-Generated User Interfaces

Task-Driven Evolving Models

Malleable & Co-Created Interaction

Interface as a Living System

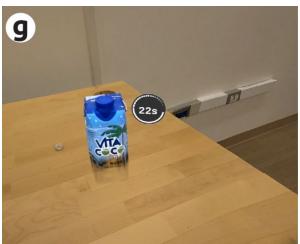
HCl is about ...



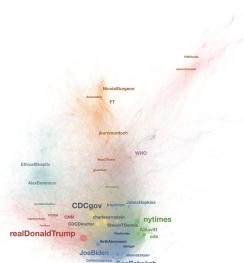
creating new possibilities
for interaction.



questioning technology through design.



blending the virtual and physical to reshape experience.



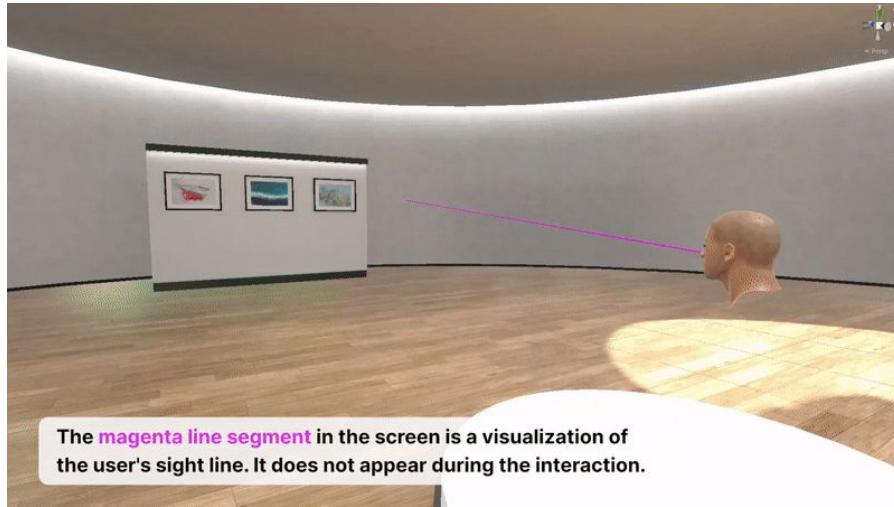
understanding technology as a social practice.

The screenshot shows a mobile application interface for food delivery. At the top, there's a header bar with the text "Dinner Party". Below it, a date "09/27/2024" and a location "955 Sutter St, San Francisco" are displayed. The main content area features a map of San Francisco with several delivery options highlighted by green boxes:

- UN Market
- Whole Foods Market
- Silken Tofu
- Doublingjiang
- Sichuan Peppercorns

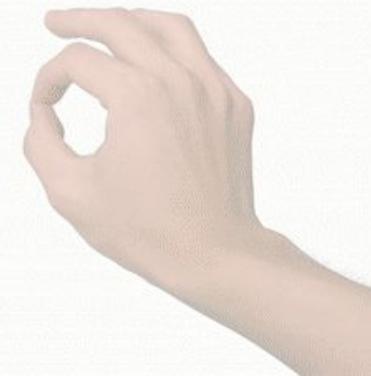
Below the map, there are buttons for "Map" and "List" modes, and a "Get Directions" button. At the bottom, there are tabs for "Home", "Nearby Restaurants", "Meals", and "Groceries".

rethinking interfaces in the age of AI.



FocusFlow: Gaze Interaction

ForcePinch



ForcePinch: Gesture Interaction

