Interaction Design & Virtual Reality

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Assistant Prof.

2016.11.04

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Slides ↓

http://www.slideshare.net/yushhuang/vrar-vr-ar-technologies-in-medical-applications-62698281

Collaborative VR $\longrightarrow$ Assignment

prototyping

without writing code

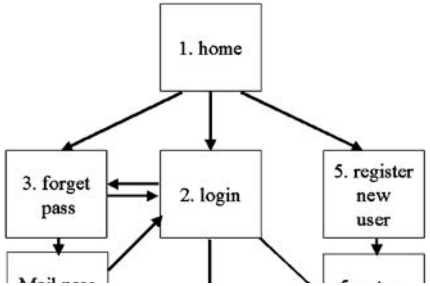
as much as possible

Prototyping techniques

- Static representation
  - Site map, story boards, schematics, mock-ups

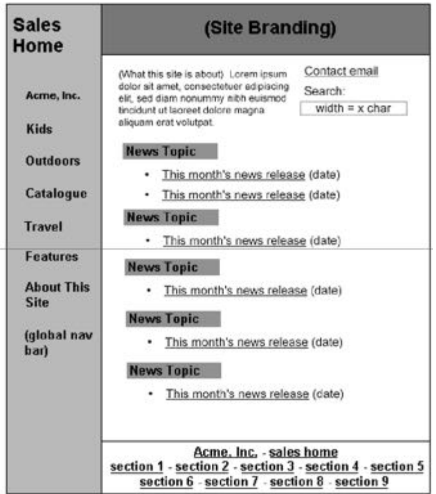
- Dynamic representation
  - Video prototyping
  - Paper prototyping
  - Wizard of Oz
  - Interactive Prototype

static representations



site maps

storyboards



schematics

mock-ups

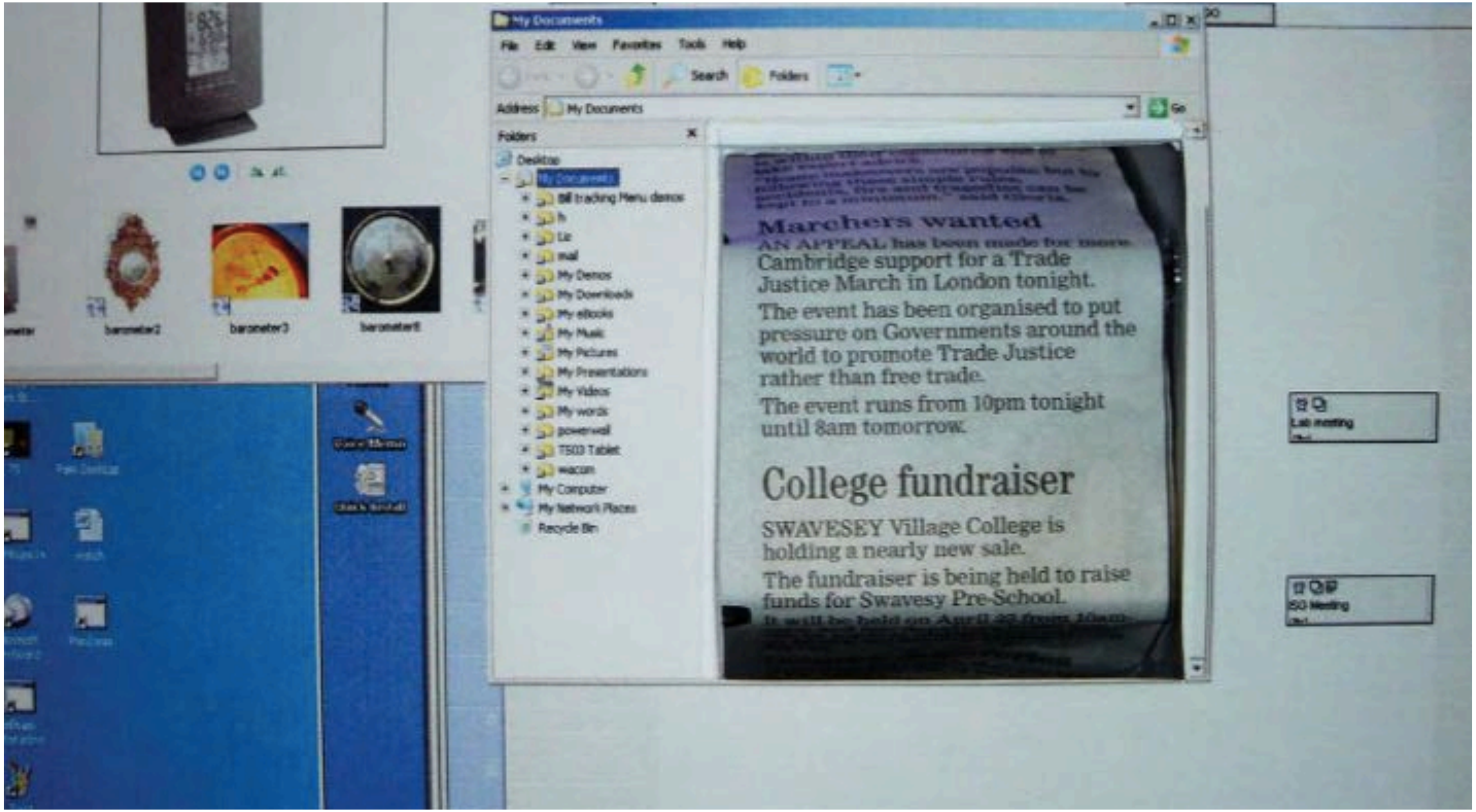
- a lot of what we design is **dynamic…**

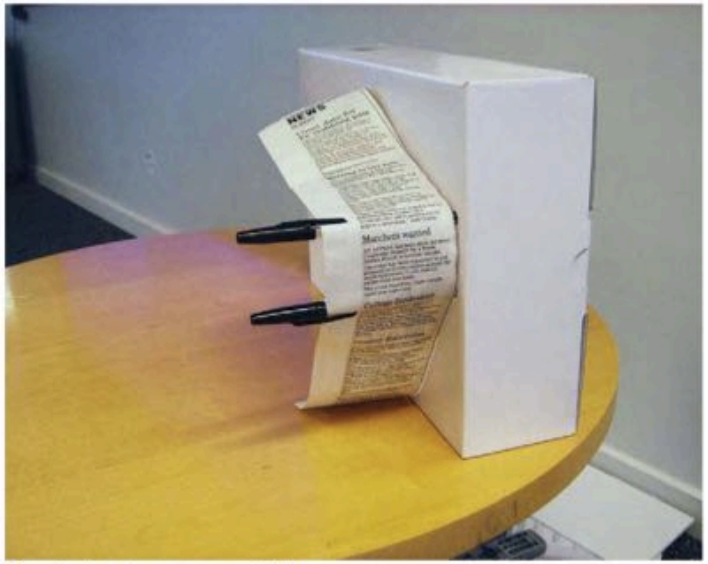
video prototyping

Image from Beaudouin-Lafon & Mackay

The Bifocal Display

(Apperley & Spence,1980; Spence & Apperley, 1982).


My Documents
File Edit View Favorites Tools Help
Search
Folders
Address
My Documents
Go
Folders
Desktop
My Documents
My Demos
My Downloads
My eBooks
My Music
My Pictures
My Presentations
My Videos
My words
powerwall
wacom
My Computer
My Network Places
Recycle Bin
barometer2
barometer3
Marchers wanted
Cambridge support for a Trade Justice March in London tonight.
The event has been organised to put pressure on Governments around the world to promote Trade Justice rather than free trade.
The event runs from 10pm tonight until 8am tomorrow.
College fundraiser
SWAVESEY Village College is holding a nearly new sale.
The fundraiser is being held to raise funds for Swavesey Pre-School.
Lab meeting
ISO Meeting



Step 3: Feed paper over guides

Step 4: Create "Window"

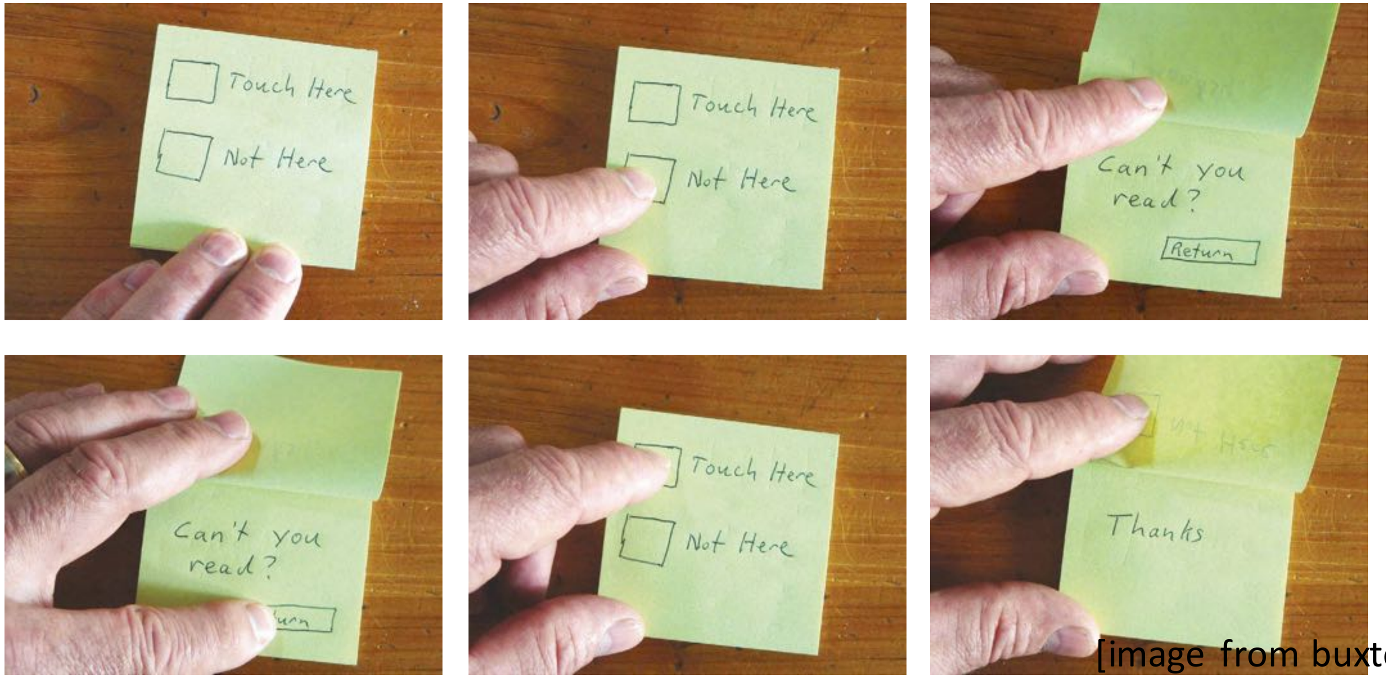
Step 5: Add "Desktop" of you operating system of Choice

Step 6: Align Camcorder and shoot the "Desktop"

- But video prototyping is
  - not interactive
  - hard to edit
  - disposable (can not re-use)
  - not “real”

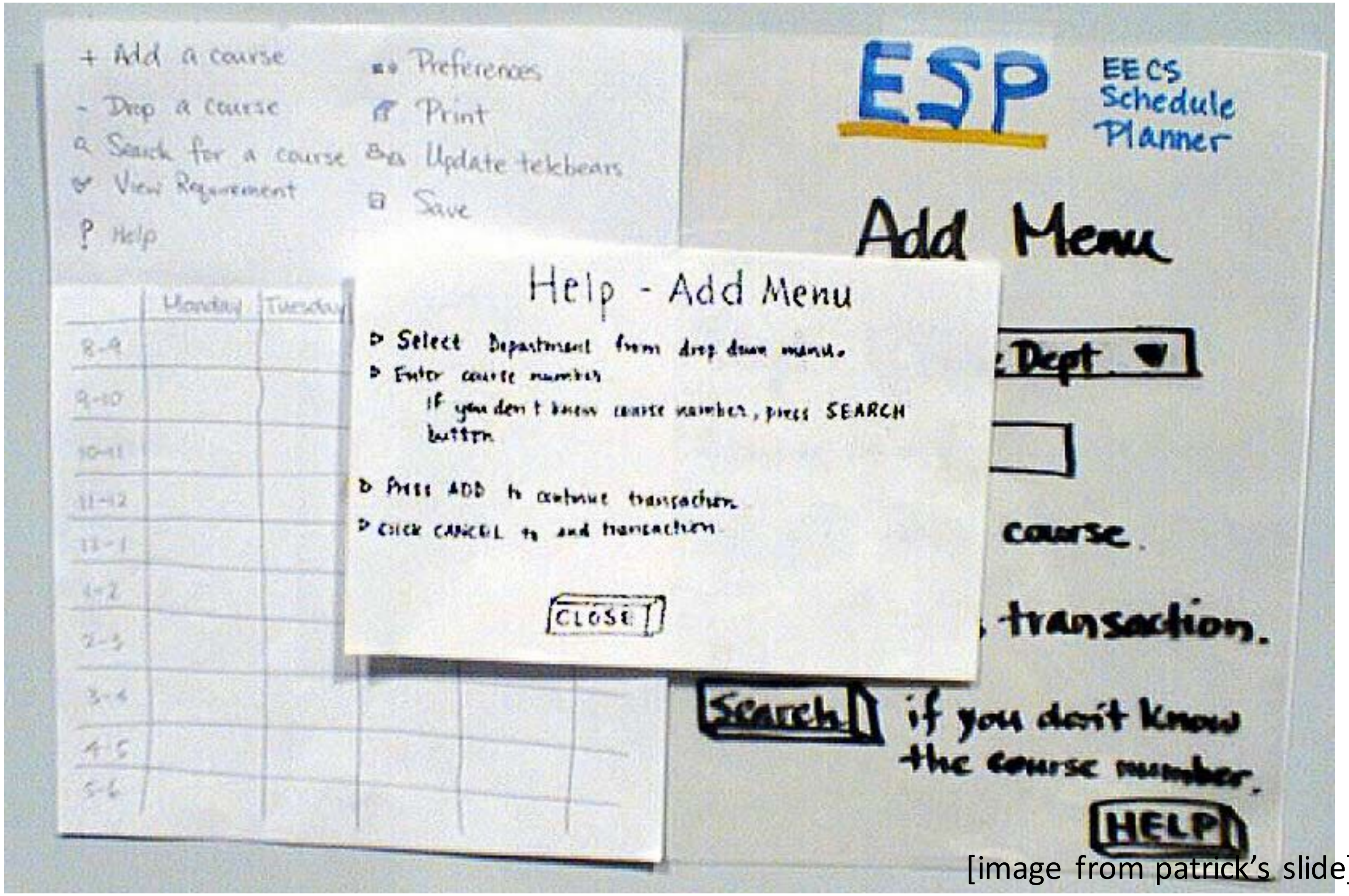
Paper Prototyping

- Interactive paper interfaces **respond** to the interaction of the user, with the help of someone



[image from buxton's slide]

Paper Prototyping



[image from patrick's slide]

• with regards to the mecahnics of manipulating a paper interface.

1. **to quickly explore a concept**, designer might be both the user and the facilitator
2. **to have a quick insight**, designer can play the role of the facilitator with a representative from the target group
3. **for usability testing**, design is tested with multiple users, to find errors and such. The aim is not to find the right design, rather it is **to right an agreed upon design.** Thus, the design cannot be changed from user to user.

   for the usability test, a team is necessary, consisting of **a facilitator, a computer, a videographer** and **an observer**, at least.

The Wonderful Wizard of Oz

A method of testing a system that does not exist

“Wizard of Oz Technique” ------ Fake it before you build it.

The aim is to experience interactive systems, before they are real, even before we have arrived at their final design.

With the example of the Wizard, we see that we can conjure up systems that will let users have real and valid experiences, before the system exists in any normal sense of the word.

The Wizard of Oz Technique involves making a working system, where the person using it is unaware that some or all of the system’s functions are actually being performed by a human operator, hidden somewhere “behind the screen.”

<u>The Listening Typewriter</u> , IBM 1984

Figure 81: The Wizard's Listening Typewriter
A perfectly functional listening typewriter is implemented simply by having a fast typist, hidden behind the screen, who would enter the text captured from the microphone.

what are
prototyping
techniques
In VR ?

Multi-Device Storyboards for Cinematic Narratives in VR

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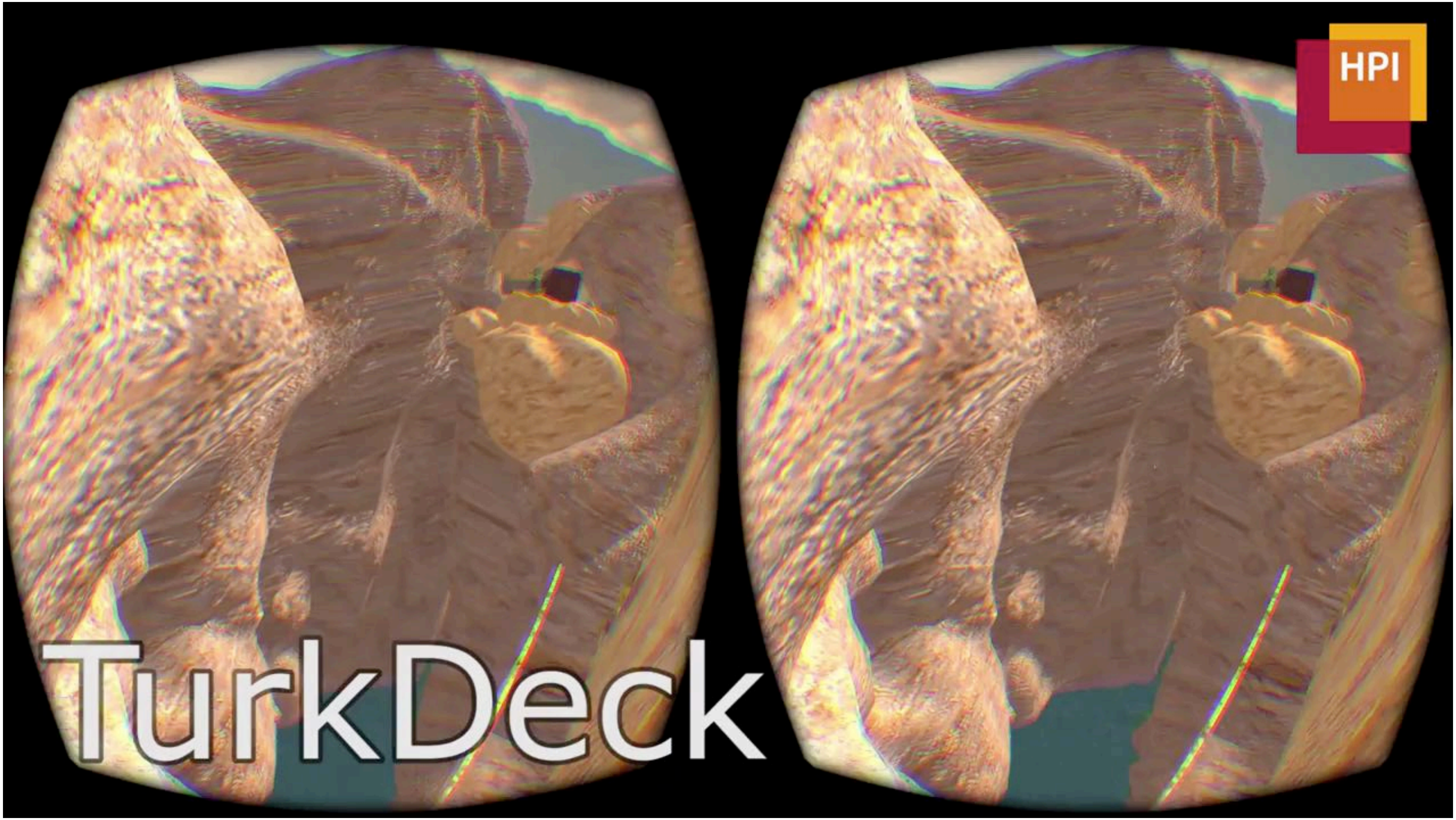
HPI
Haptic Turk
a motion platform based on people


TurkDeck

歷代優勝作品

https://www.youtube.com/watch?v=l6S7SSB83IQ

超級變變變

technically speaking,
it is video prototyping


資料來源： Yang Young
歴代優勝作品メドレー
Exoskeleton haptic interface
Force feedback
第10回(1983年)


歴代優勝作品メドレー
資料來源： Yang Young
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資料來源： Yang Young
歴代優勝作品メドレー


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歴代優勝作品メドレー
資料來源： Yang Young

Multi-Device Storyboards for Cinematic Narratives in VR

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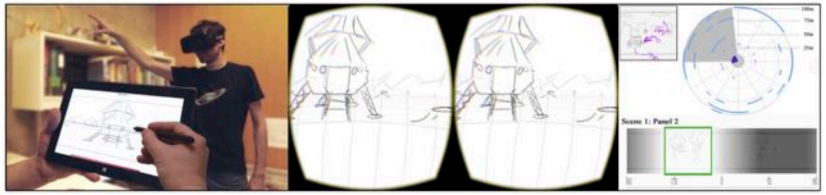

Figure 1: Our multi-device system supporting the planning of virtual reality stories: a storyboard artist sketches the virtual environment of a scene moment using a lightweight tablet-based interface, while the director experiences the scene within VR. Additional dynamic overhead (top-right) and panoramic views (bottom-right) offer different perspectives on the scene to further support planning.

ABSTRACT
Virtual Reality (VR) narratives have the unprecedented potential to connect with an audience through *presence*, placing viewers within the narrative. The onset of consumer VR has resulted in an explosion of interest in immersive storytelling. Planning narratives for VR, however, is a grand challenge due to its unique affordances, its evolving cinematic vocabulary, and most importantly the lack of supporting tools to explore the creative process in VR.

In this paper, we distill key considerations with the planning process for VR stories, collected through a formative study conducted with film industry professionals. Based on these insights we propose a workflow, specific to the needs of professionals creating storyboards for VR film, and present a multi-device (tablet and head-mounted display) storyboard tool supporting this workflow. We discuss our design and report on feedback received from interviews following demonstration of our tool to VR film professionals.

Author Keywords
Virtual Reality; storyboard; sketching; 3D; movie.

ACM Classification Keywords
H5.2 [User interfaces]: Graphical user interfaces; Virtual Reality; H5.m [Miscellaneous]: Stereoscopic display

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INTRODUCTION
Head-mounted displays (HMDs) have evolved over half a century from research prototypes [29] to consumer products [36, 37, 38]. The entry of VR technology into homes has caused a surge of interest in the medium among developers, filmmakers and storytellers. Major film festivals, studios, and technology companies [12, 21, 30, 39] have created teams specifically targeted at *VR stories*: where live-action, or animated narratives occur in fully immersive environments, where the viewer experience is uniquely intimate.

VR is characterized by a quality known as *presence* – the feeling of actually being on location in a story rather than experiencing it from the outside [27]. This new medium provides a unique opportunity for viewer engagement and the exploration of novel storytelling, but requires the development of new cinematic constructs and film language [24].

Creating a movie for VR is not as simple as taking a regular script and going through the well-developed film making process. The unique properties of VR require directors to consider concepts such as presence and peripheral vision, and use them effectively. Directors also must address the challenge of guiding an audience through a narrative, while leaving them free in a fully immersive environment, to look or move in any direction, and even trigger events within the environment. Traditional cinematic principles of cuing and staging can help solve this problem, but need to evolve with the immersive use of spatial visual and auditory cues.

We learned through our multiple interviews that, no one currently knows how to properly plan for immersive narratives. Traditional storyboards and planning tools are shallow and restrictive given the full extent of the environment that needs to be discussed. Communicating ideas between individuals is further impeded by the experiential quality of VR. Film teams thus rapidly model, collect, and assemble

Haptic Turk: a Motion Platform Based on People

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ABSTRACT
Motion platforms are used to increase the realism of virtual interaction. Unfortunately, their size and weight is proportional to the size of what they actuate. We present *haptic turk*, a different approach to motion platforms that is light and mobile. The key idea is to replace motors and mechanical components with humans. All haptic turk setups consist of a *player* who is supported by one or more *human-actuators*. The player enjoys an interactive experience, such as a flight simulation. The motion in the player's experience is generated by the actuators who manually lift, tilt, and push the player's limbs or torso. To get the timing and force right, timed motion instructions in a format familiar from rhythm games are displayed on actuators' mobile devices, which they attach to the player's body. We demonstrate a range of installations based on mobile phones, projectors, and head-mounted displays. In our user study, participants rated not only the experience as player as enjoyable (6.1/7), but also the experience as an actuator (4.4/7). The approach of leveraging humans allows us to deploy our approach anytime anywhere, as we demonstrate by deploying at an art festival in the Nevada desert.

Author Keywords
Haptics; force-feedback; motion platform; immersion.

ACM Classification Keywords
H5.2 [Information interfaces and presentation]: User Interfaces. - Graphical user interfaces.

INTRODUCTION
For a long time, the key to immersion in interactive experience and games was sought in photorealistic graphics [8]. More recently, game makers made games more immersive by requiring players to physically enact the game such as with Wii (http://wii.com) and Kinect [26]. With graphics and user interaction now part of many games, many researchers argue that *haptics and motion* are the next step towards increasing immersion and realism, i.e., applying the forces triggered by the game onto the player's body during the experience.

While some game events can be realistically rendered using one or more vibrotactile actuators (e.g., driving over gravel in a racing game [14]), a much larger number of gaming events result in *directional* forces, such as centrifugal forces pulling at a steering wheel or a car bumping into the railing. Such events have been simulated using motion platforms [27]. Motion platforms are able to move one or more users around and have been used to add realism to flight simulators [22] and theme park rides.

Unfortunately, the size and weight of motion platforms tends to be proportional to what they actuate. As a result, motion platforms not only tend to be prohibitively expensive, but also large and heavy and thus stationary, limiting their use to arcades and lab environments.

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Figure 1: Haptic turk allows producing motion experiences anywhere anytime. Here, the suspended player is enjoying an immersive hang gliding game. The four *actuators* create just the right physical motion to fill in the player's experience.

In this paper, we present *haptic turk*, a software platform that allows experiencing motion anywhere there is people. Its key idea is to substitute the motors and mechanical components of traditional motion platforms with humans.

HAPTIC TURK
Haptic turk is a motion platform based on people. The name is inspired by the 18th century chess automaton "The Turk" [20] that was powered by a human chess master.

The specific configuration shown in Figure 1 involves one *player* located in the center. The player is enjoying an immersive experience, here a first-person simulation of flying a hang-glider, running on a hand-held device (iPad). In the shown setup, the player can steer the hang-glider by tilting the iPad.

The main difference to regular video games is that the player's experience comes with *motion*—this motion is administered by *human-actuators* who *manually* lift, tilt, and push the player around. Here there are four of them.

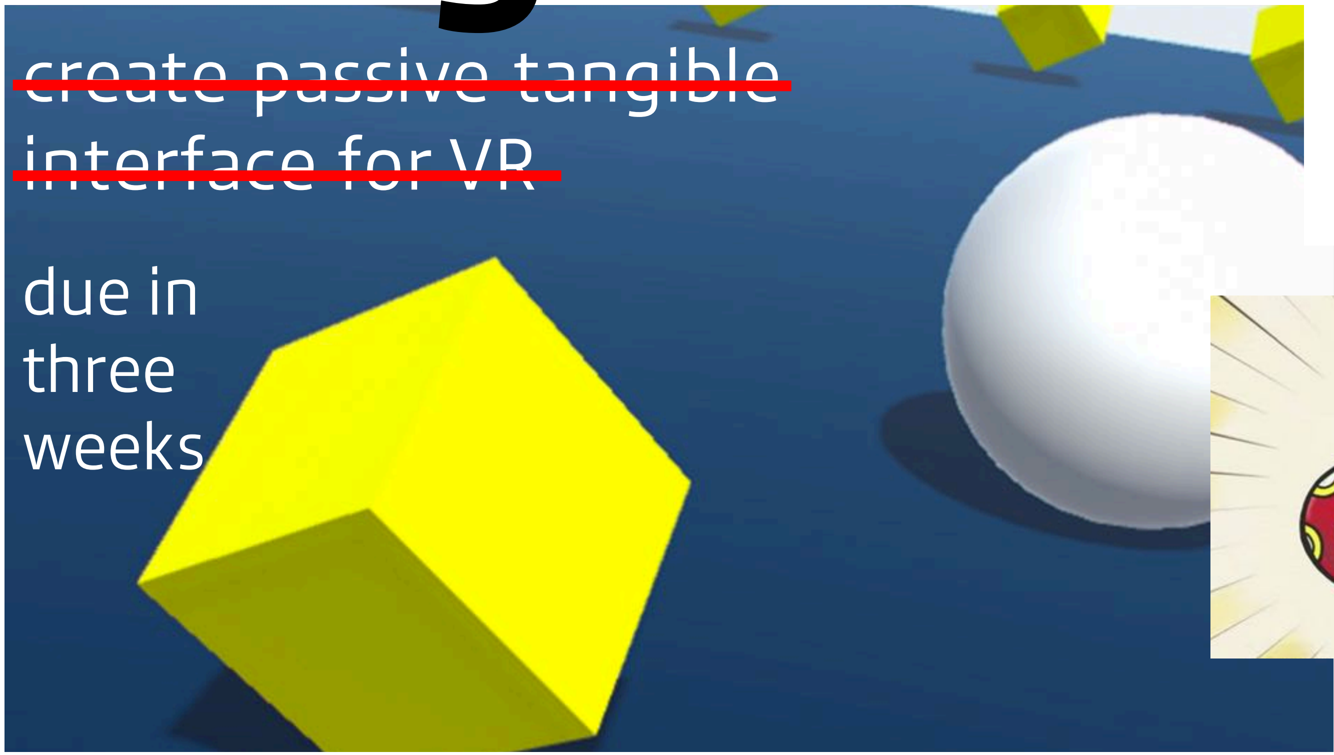
To get the timing and force right, all actuators receive timed motion instructions in a format familiar from rhythm games (see Figure 3 for a preview). In the set-up shown in Figure 1, actuators receive these motion instructions on

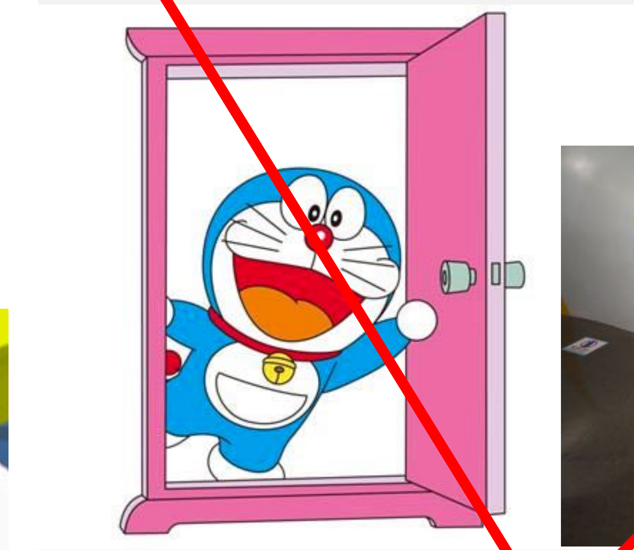
Designing Collaborative Interaction in VR

assignment

~~create passive tangible interface for VR~~

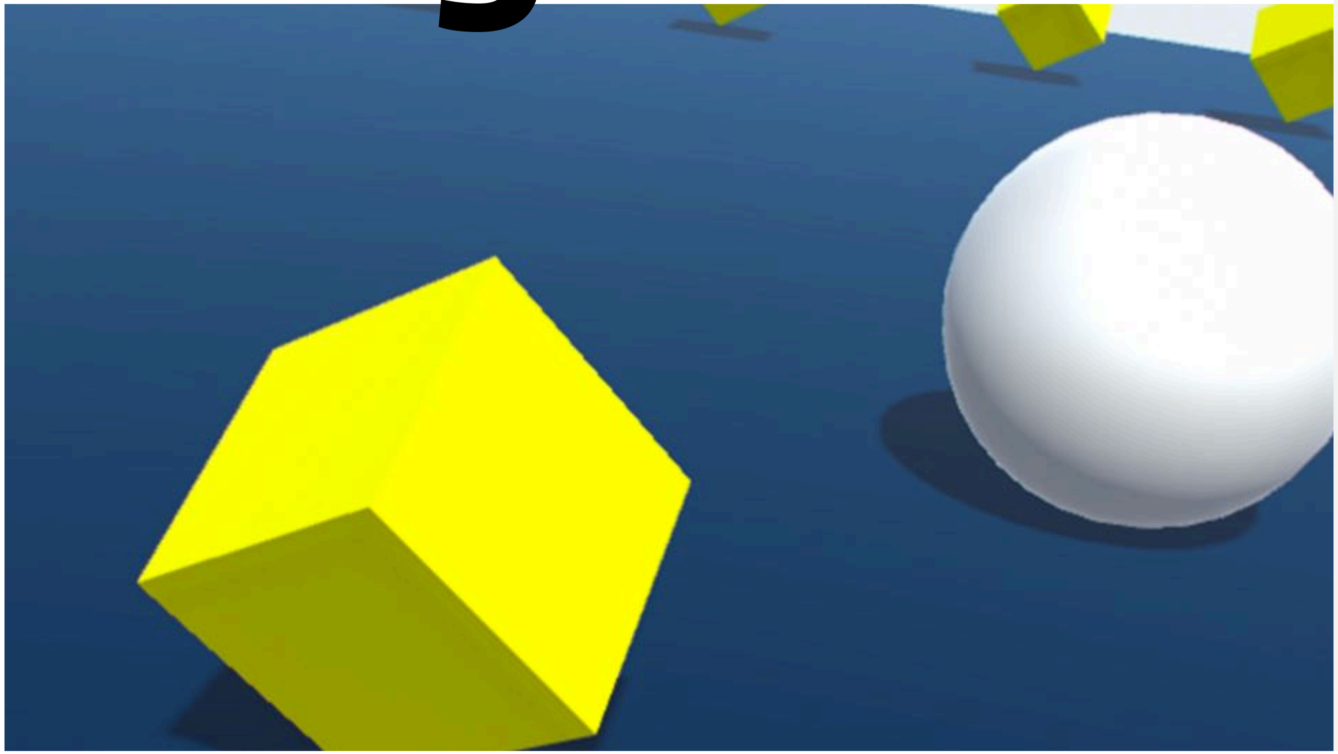
due in three weeks






cooperative,
competitive , or ?
make
spectators
players

assignment



- Together-Rolling-A-360-Ball
- Team proposes ideas of Colla-VR on 11th, Nov.
- A storyboard to describe your idea, which should contains
    - Show interaction details with Lo-Fi sketches.
    - Create a main figure with Hi-Fi sketch for the cover of your presentation.
    - Trick: mix photo with sketches
- Present on **11/11 lecture.**
- Submit your implementation (e.g., video) **on 11/25.**