

Alvaro CASSINELLI

Associate Professor, School Of Creative Media (CityU)
Director Augmented Materiality Laboratory

- Art & Science
- Spatial Augmented Reality
- Human Computer Interfaces, Prosthetics
- Augmented Materiality, IoT, Wearables

projects: www.alvarocassinelli.com

videos: www.youtube.com/c/CassinelliAlvaro/videos

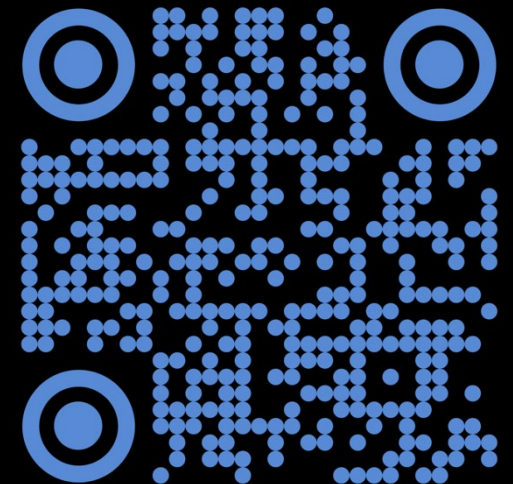
background / experience

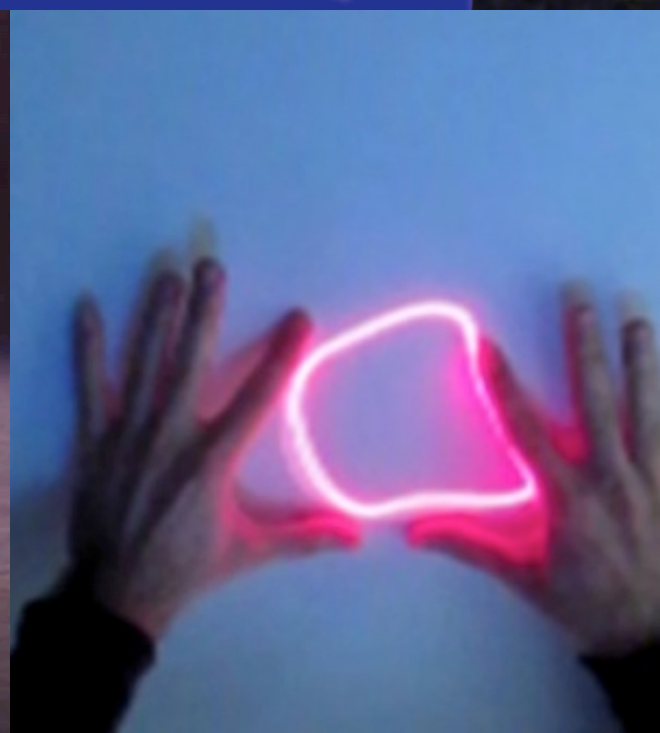
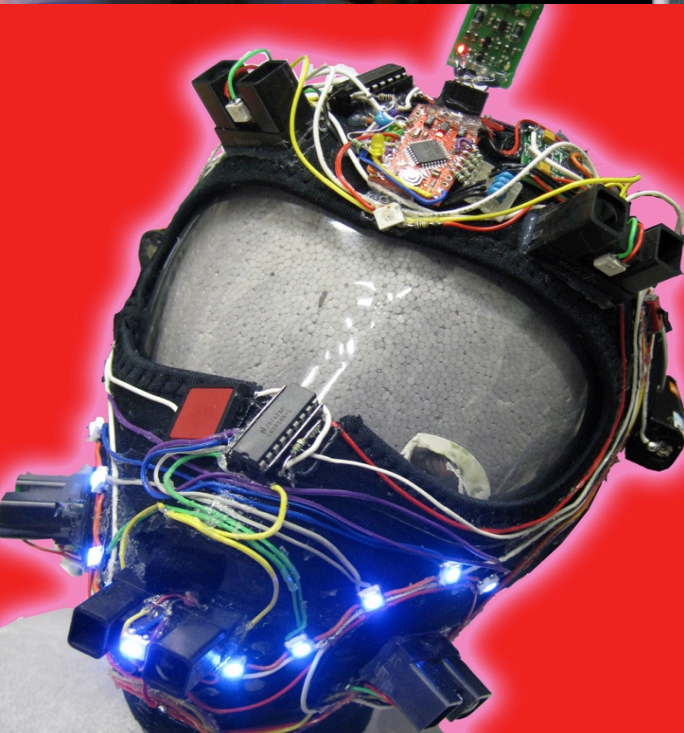
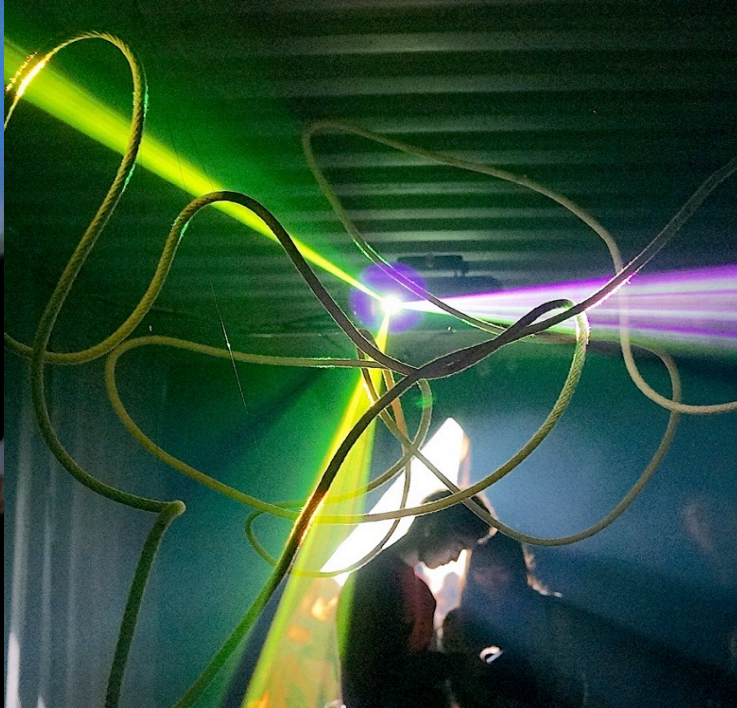
PhD in Physics & Engineering Degree (France)

Assistant Professor, Univ. of Tokyo / leader Meta-Perception Group

CTO Sinergia Tech (Uruguay)

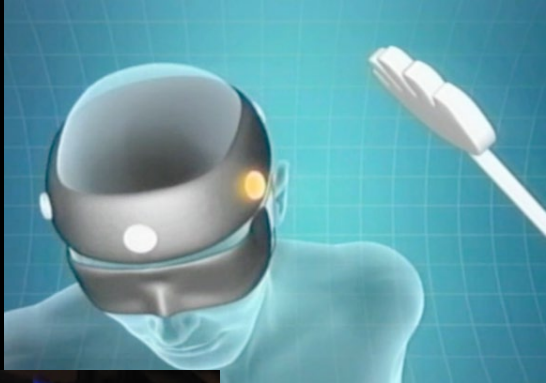
New Media Artist



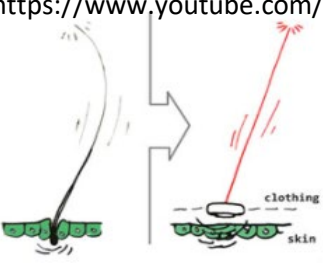


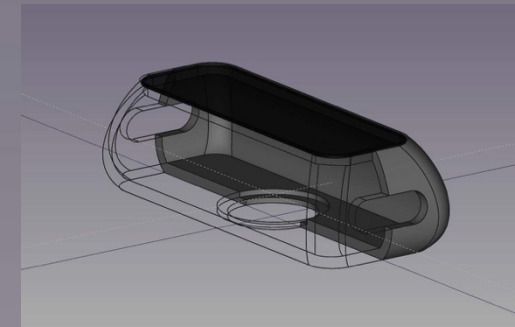
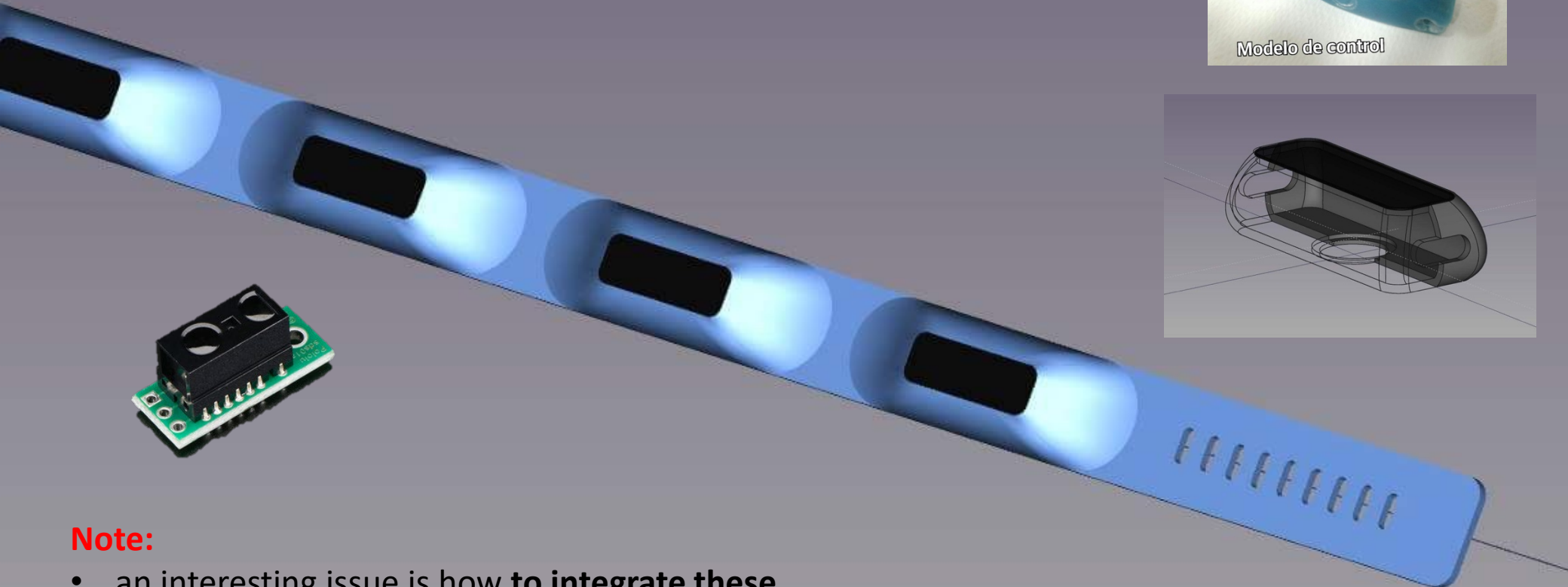
1) HAPTIC RADAR: accessibility, safety, wearables

<https://www.alvarocassinelli.com/haptic-radar/>



<https://www.youtube.com/watch?v=db87A9KydZ8&t=1s>



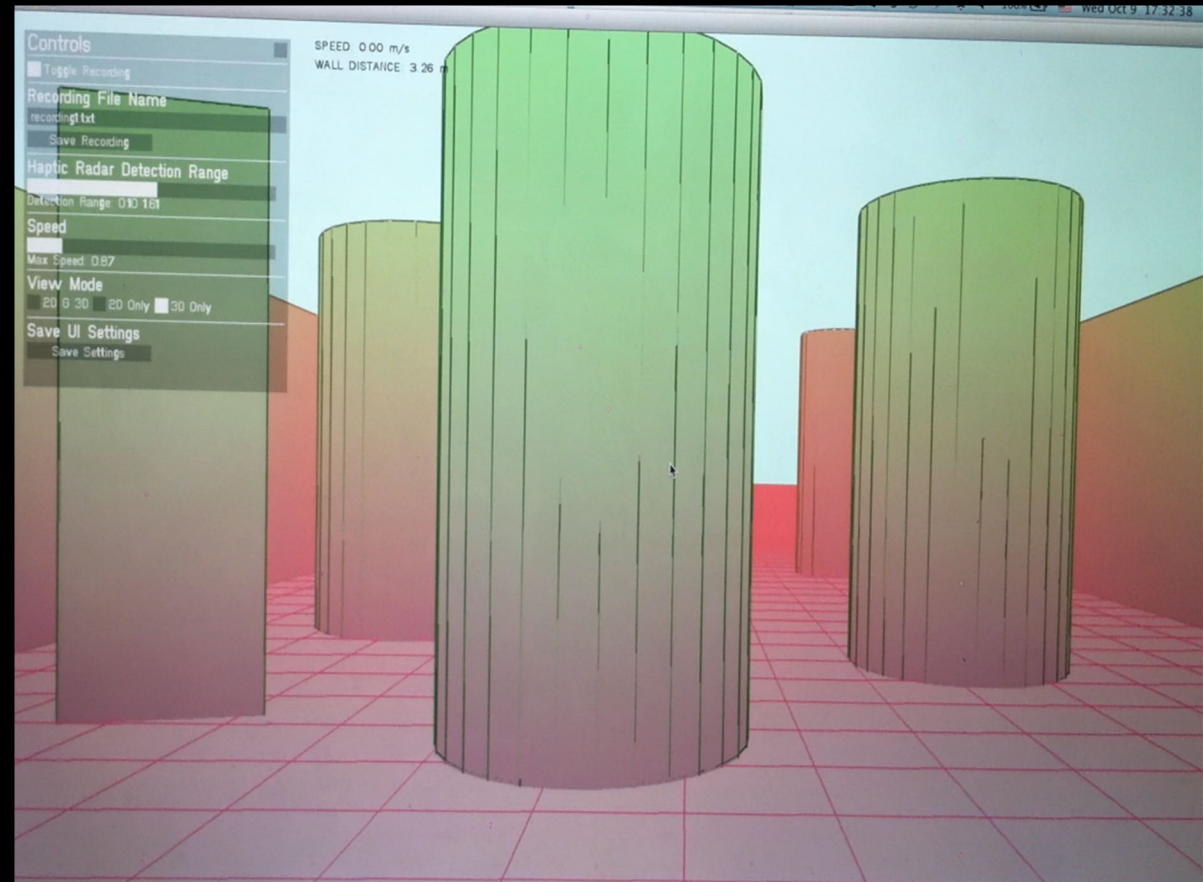


Note:

- an interesting issue is how to integrate these sensors in clothing that is fashionable

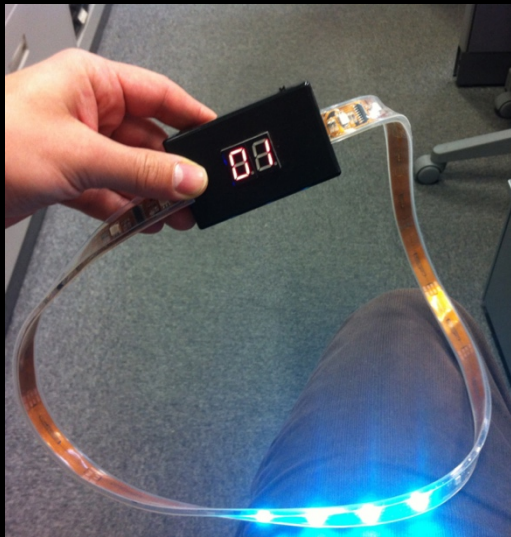
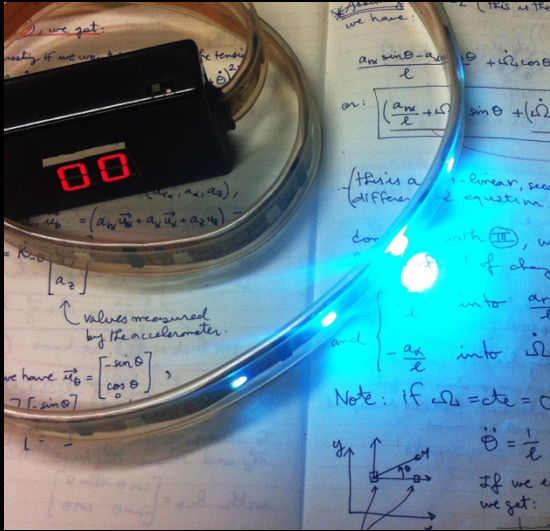
note application: Haptic immersion in gaming

<https://www.alvarocassinelli.com/haptic-games-for-the-visually-impaired/>



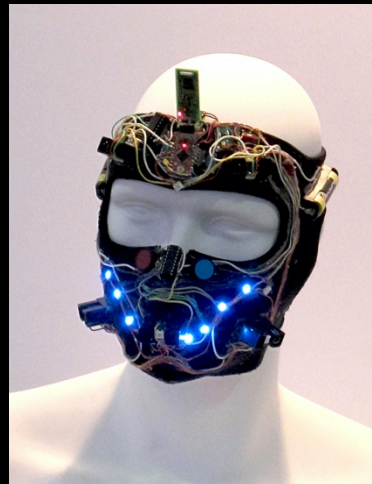
2) SCRATCHBELT – interactive/musical exercise belt

<https://www.alvarocassinelli.com/scratchbelt/>

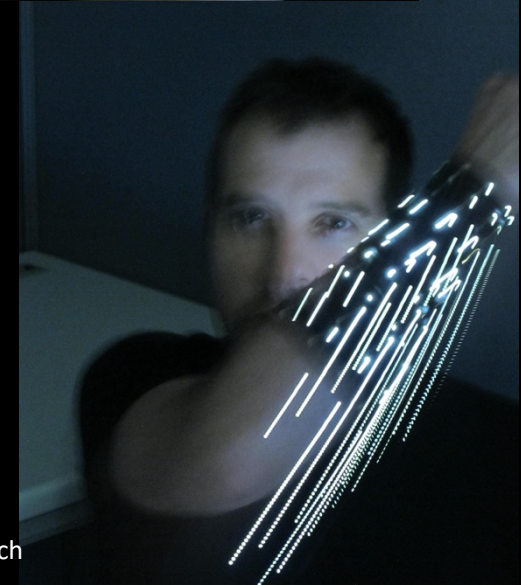


- led-strip based belt that simulates the dynamics of a hula hoop with light.
- angular data is sent wirelessly to the computer (bluetooth), where it is taken as input to an **Max-Msp** "groove" patch.
- The wearer can then "scratch" over pre-recorded sound files by contorting and dancing.
- A counter also keeps track of the number of turns, and this data can be logged on your smartphone, making it a fun alternative to the podometer.

Note: augmenting motion with light-based wearables



https://www.youtube.com/watch?v=RamTCQmNT_w&t=37s



3) LASER SENSING DISPLAY:

- new technology for large scale interactive laser projection

<https://www.alvarocassinelli.com/laser-sensing-display/>





Examples:



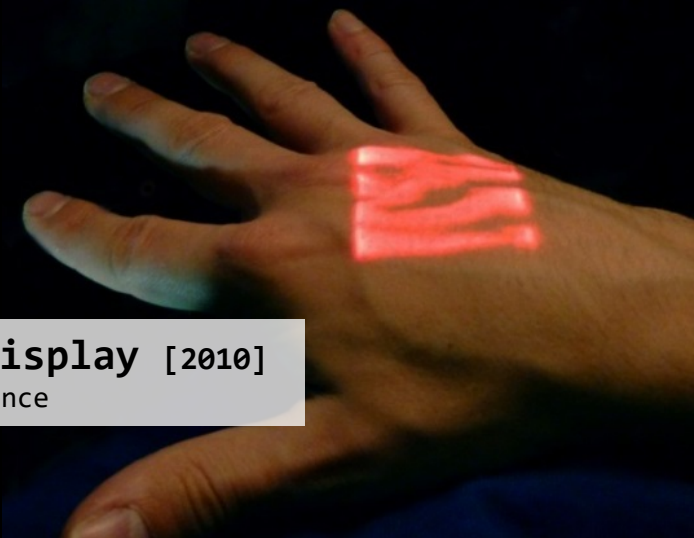
Laserinne [2010]

- interactive games on the sky slope



Smart Laser Scanner [2005~]

- hci & everywhere display



Laser Sensing Display [2010]

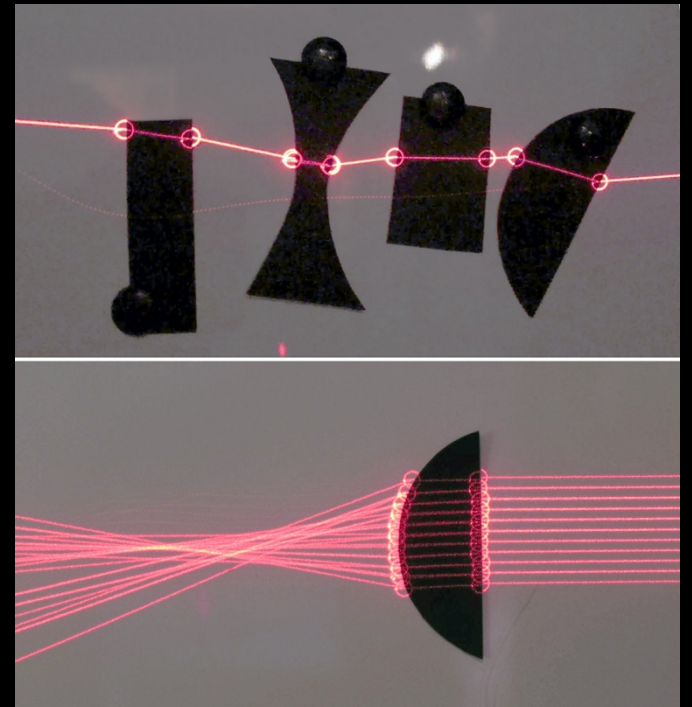
- artificial fluorescence

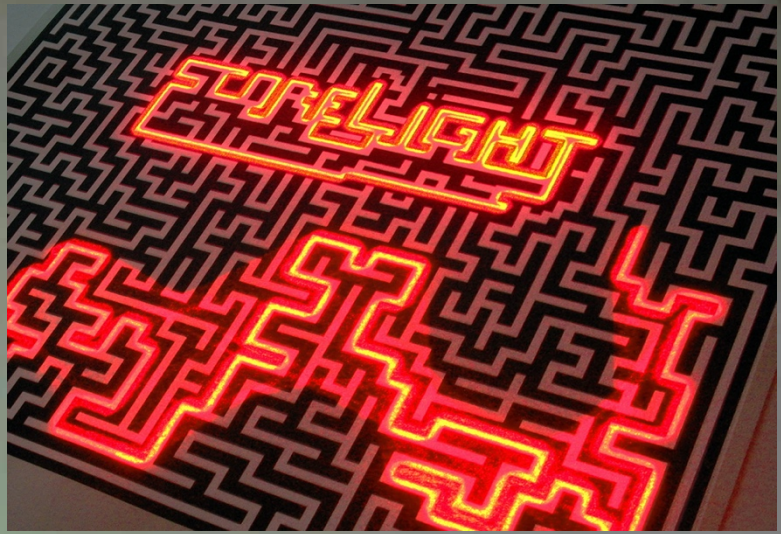


Sticky Light [2008]

- entertainment

- Deployment without calibration
- Any surface gamified by drawing





ScoreLight- human size pick up head

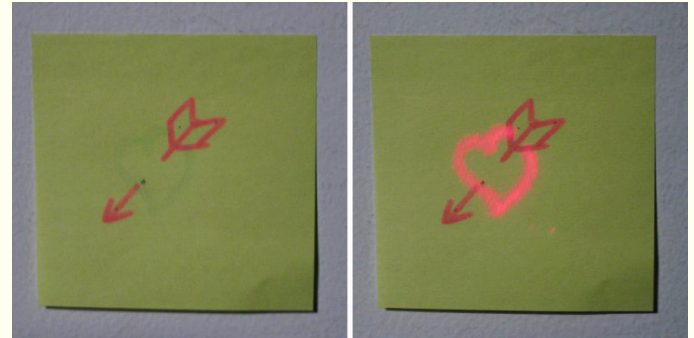
[Tokyo, 2010 / A. Cassinelli & D. Manabe]

Other uses

Synthetic fluorescence



Subcutaneous vein visualization

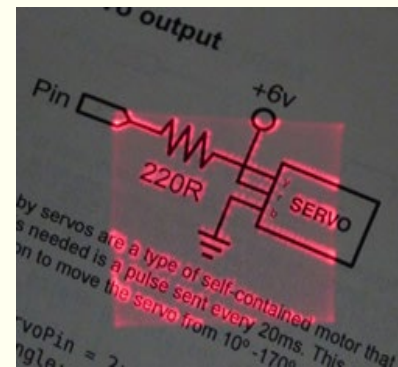


IR based watermarks (**INVISIBLE BARCODES**)

Image/volume enhancement



Based on depth...



...based on color (synthetic spectral reflectance!)

Spatial Augmented Reality laser level



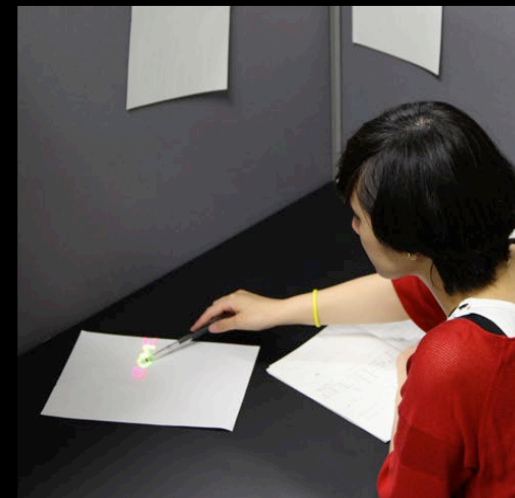
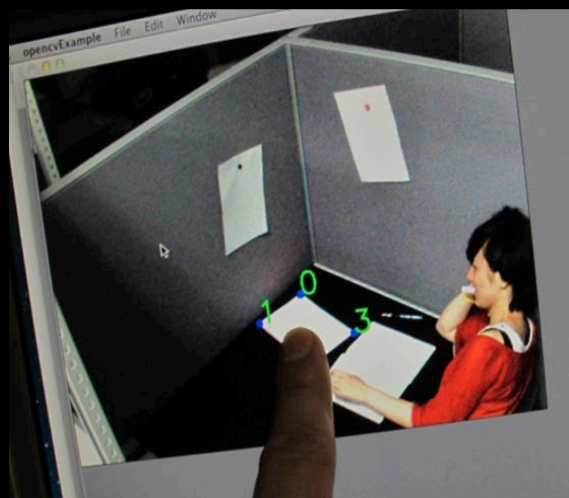
Spatial AR surveying

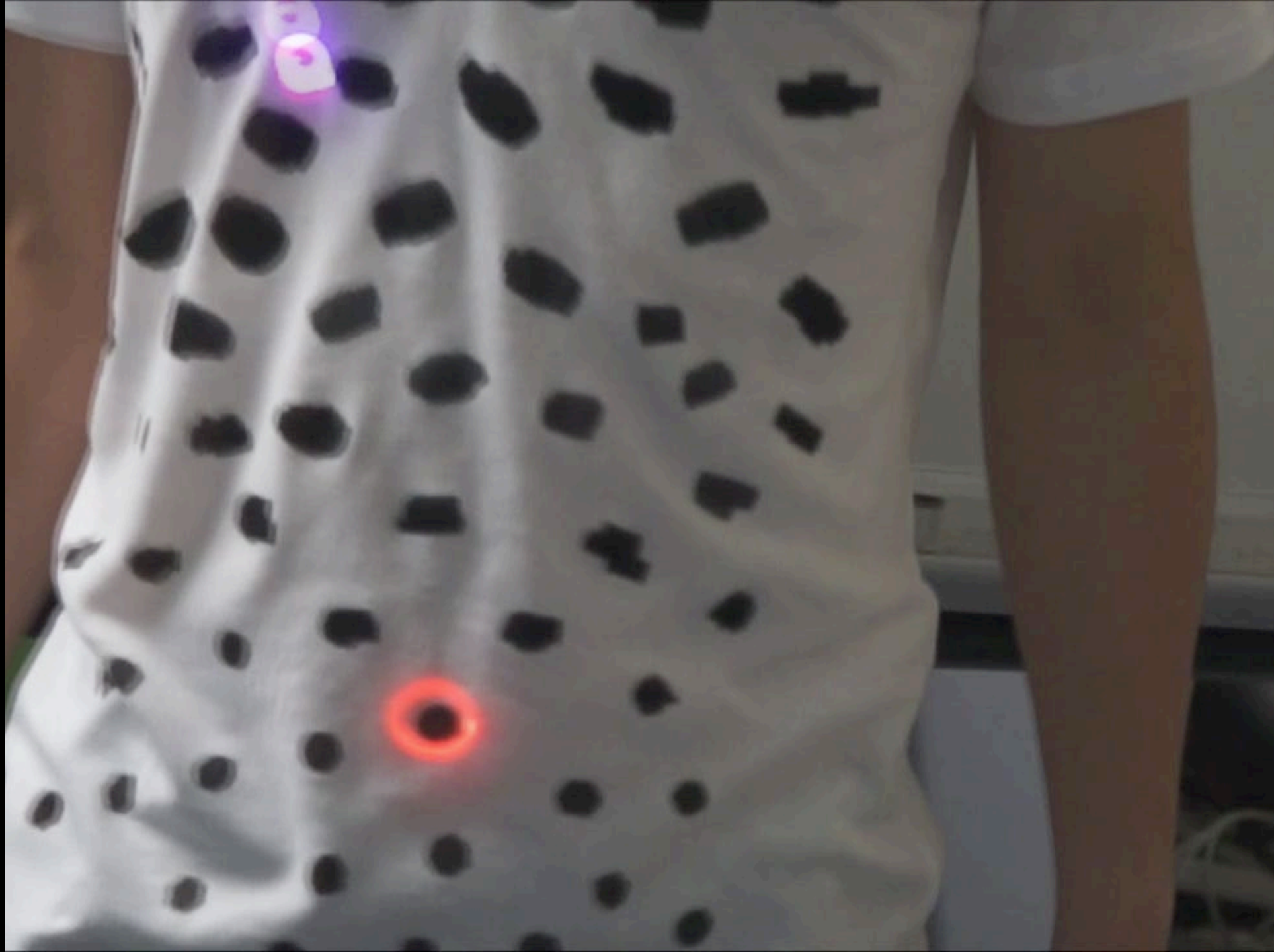
A 3D AR surveying of a living room. Red wireframe lines outline the room's dimensions and furniture. Dimensions are labeled in red: 30 (ceiling height), 120 (TV width), 90 (TV height), 250 (sofa length), 55 (chair height), 210 (chair width), and 70 (TV depth).

Smart Laser Level

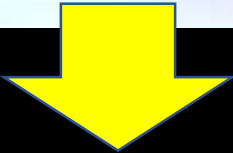
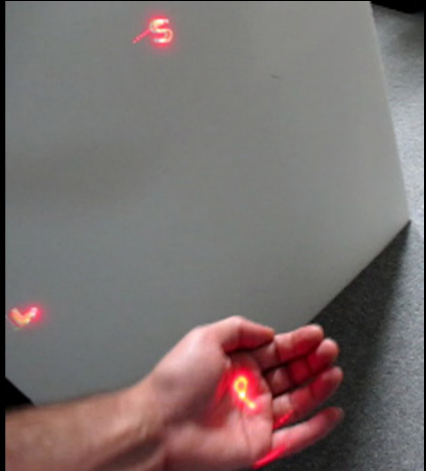
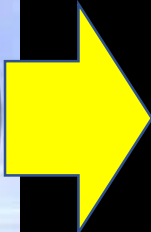
A Smart Laser Level (Leica TRI 70) on a tripod in a room. Red wireframe lines outline the room's dimensions. Dimensions are labeled in red: 320 (wall length), 240 (wall height), 230 (floor length), and 180 (floor width).A blue arrow pointing from the Smart Laser Level image to the Spatial AR surveying image.

Calibration-less projected input/output (public places)

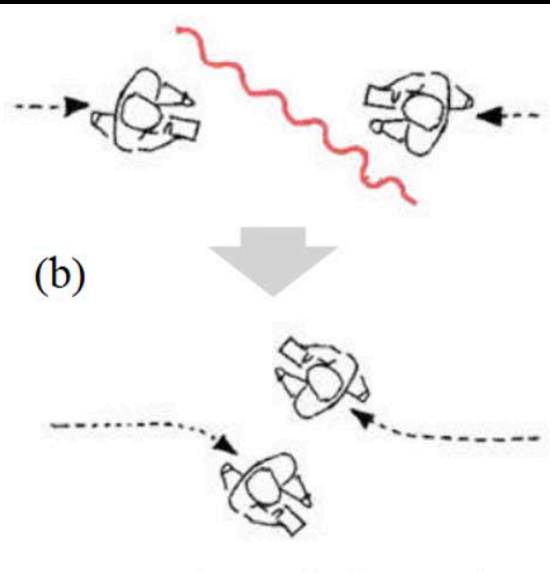
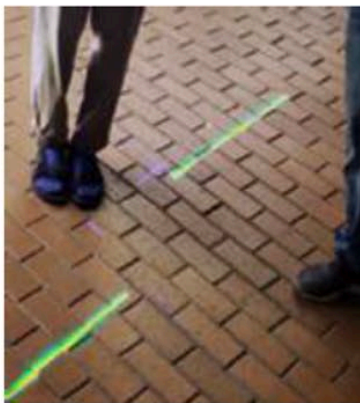
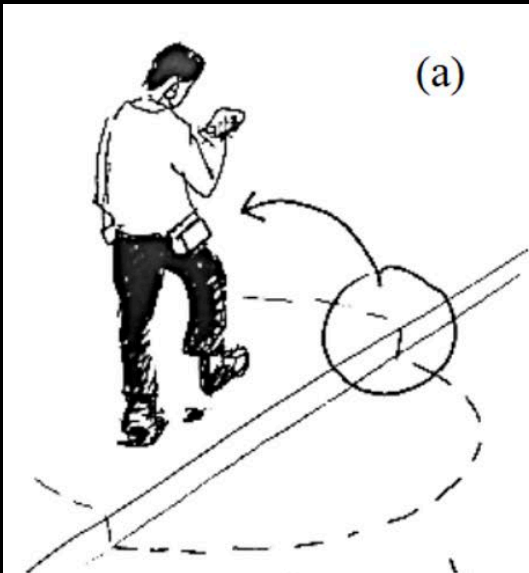
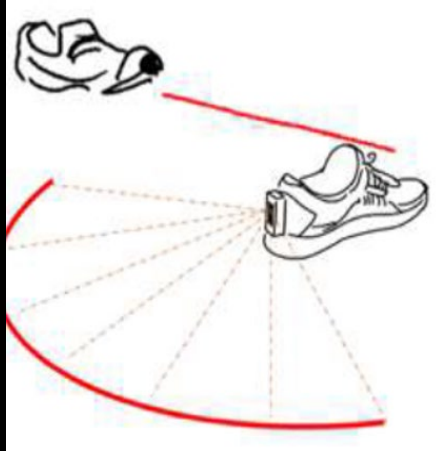
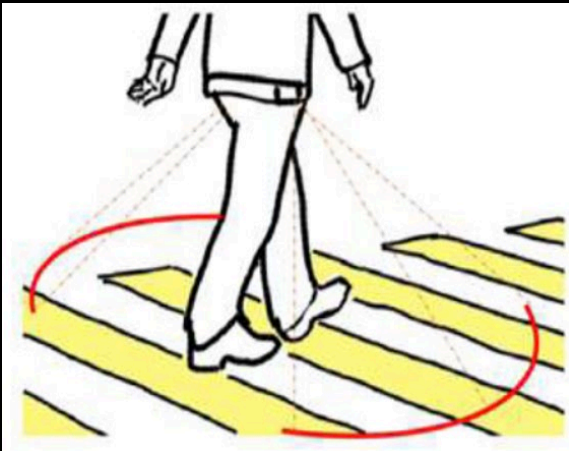




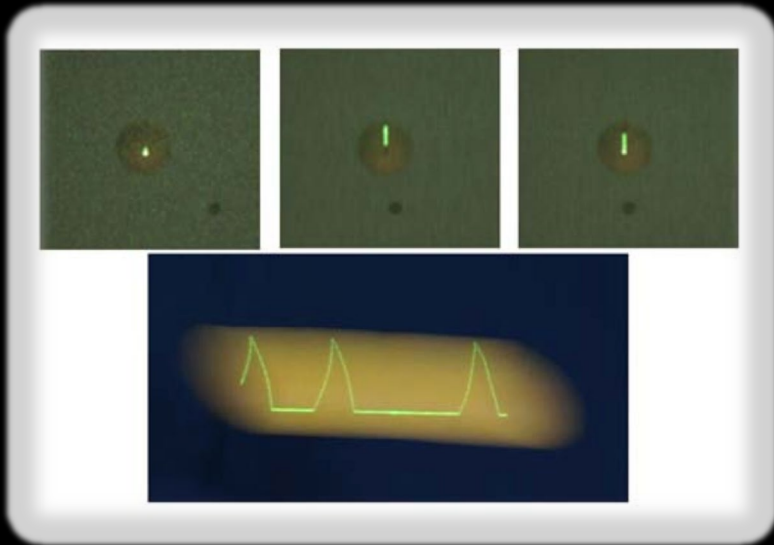
Interactive “touchable” display for Smart Voice Assistants



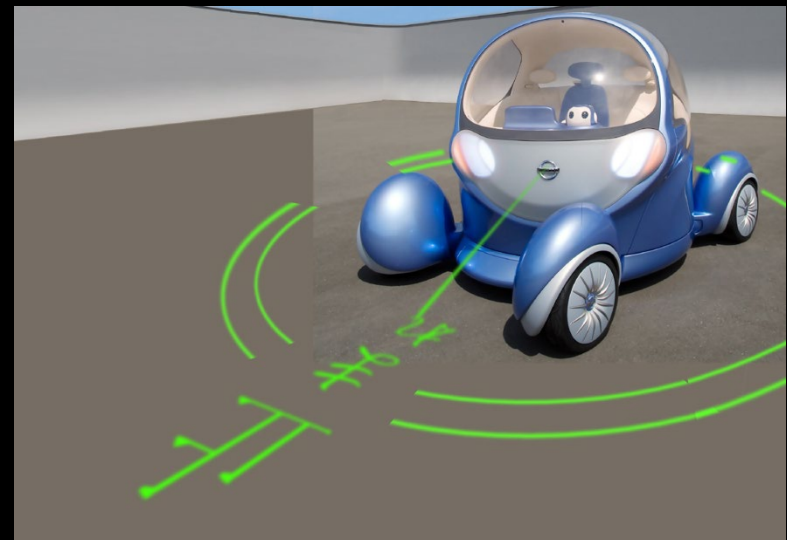
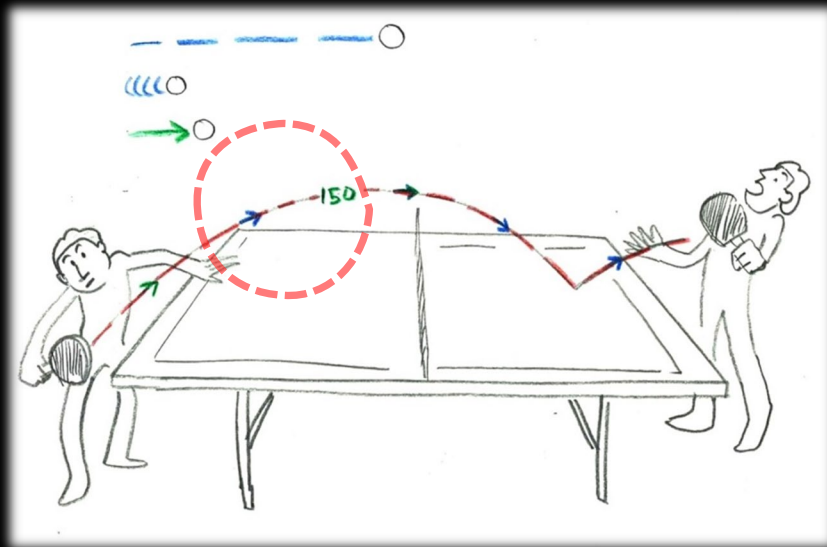
Wearable Safety System for Pedestrians (GRF grant application)



Note: patent on laser projection on moving objects.

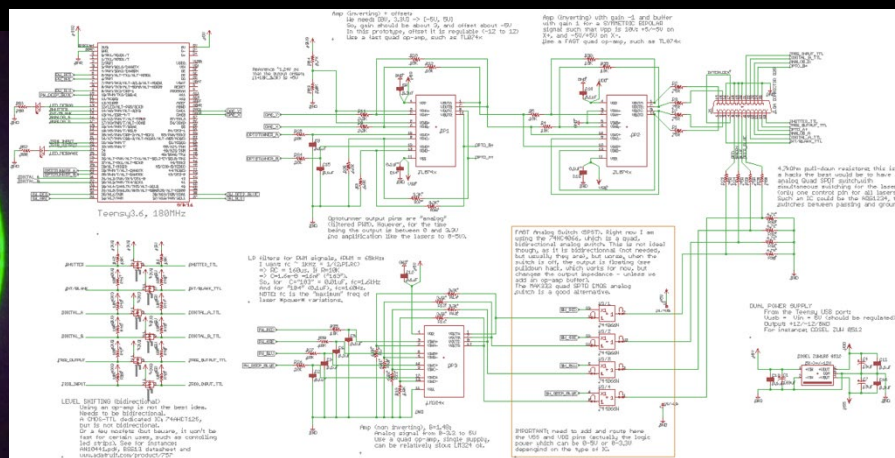
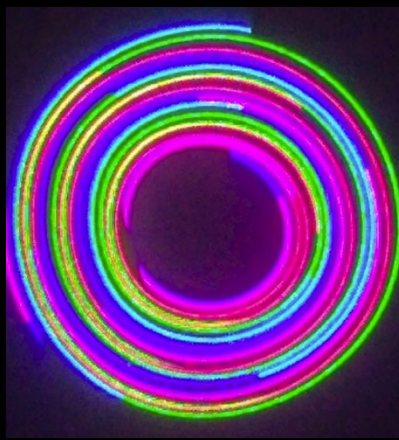
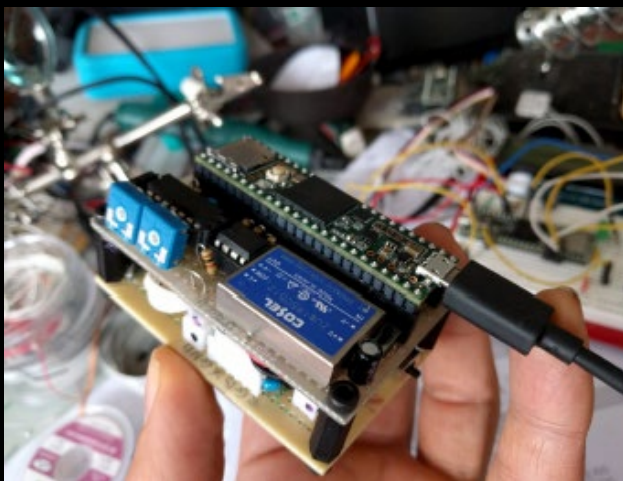
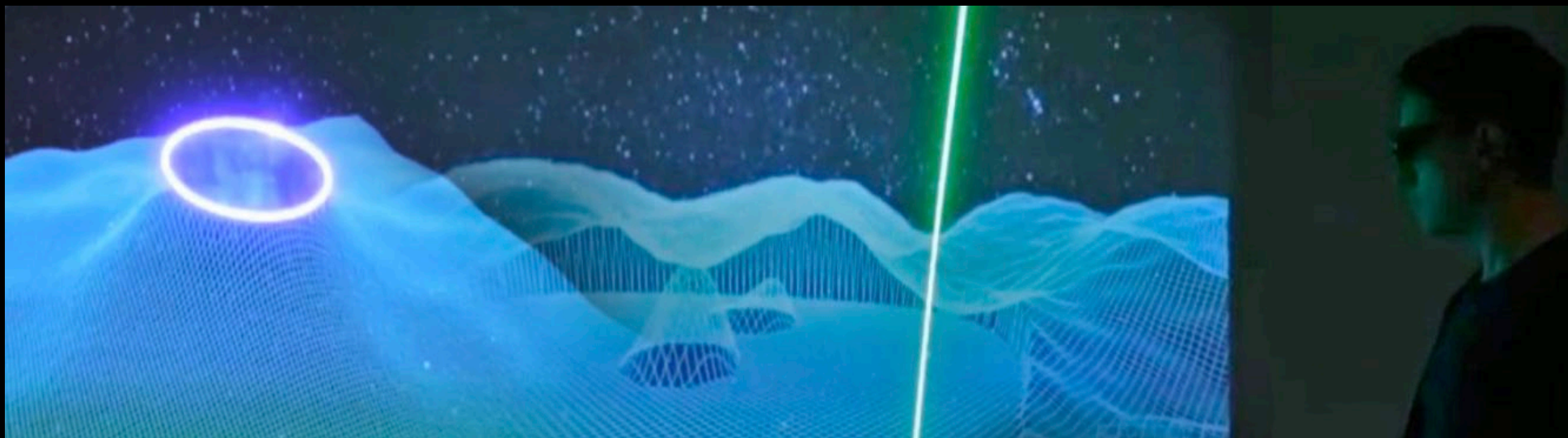


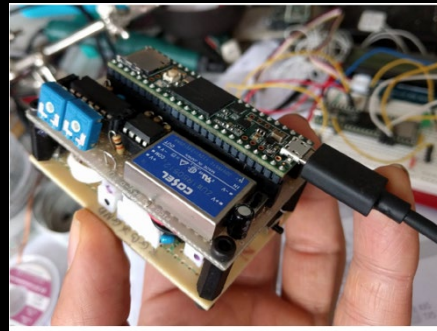
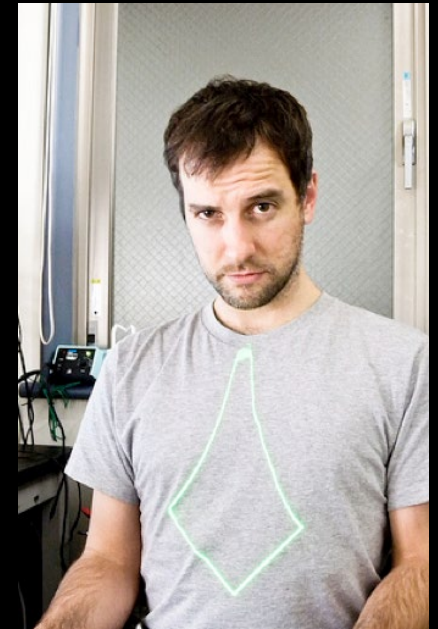
...or from moving object



Note: when this tech is ready, it has countless applications:

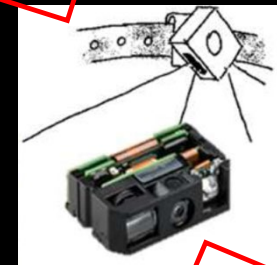
- 1) stereoscopic (CAVE) laser graphics
 - 2) super-resolution fluorescence microscopy
- etc...



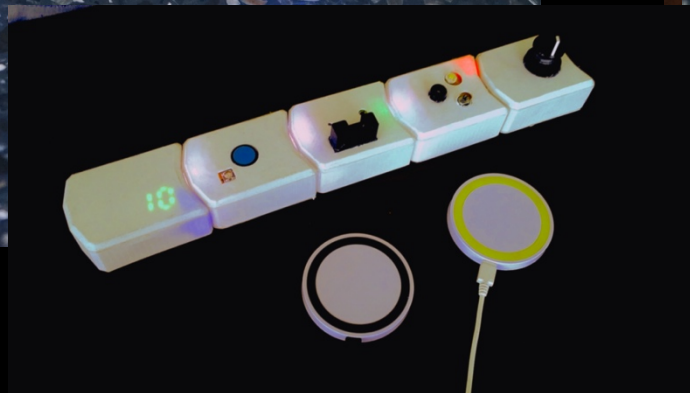
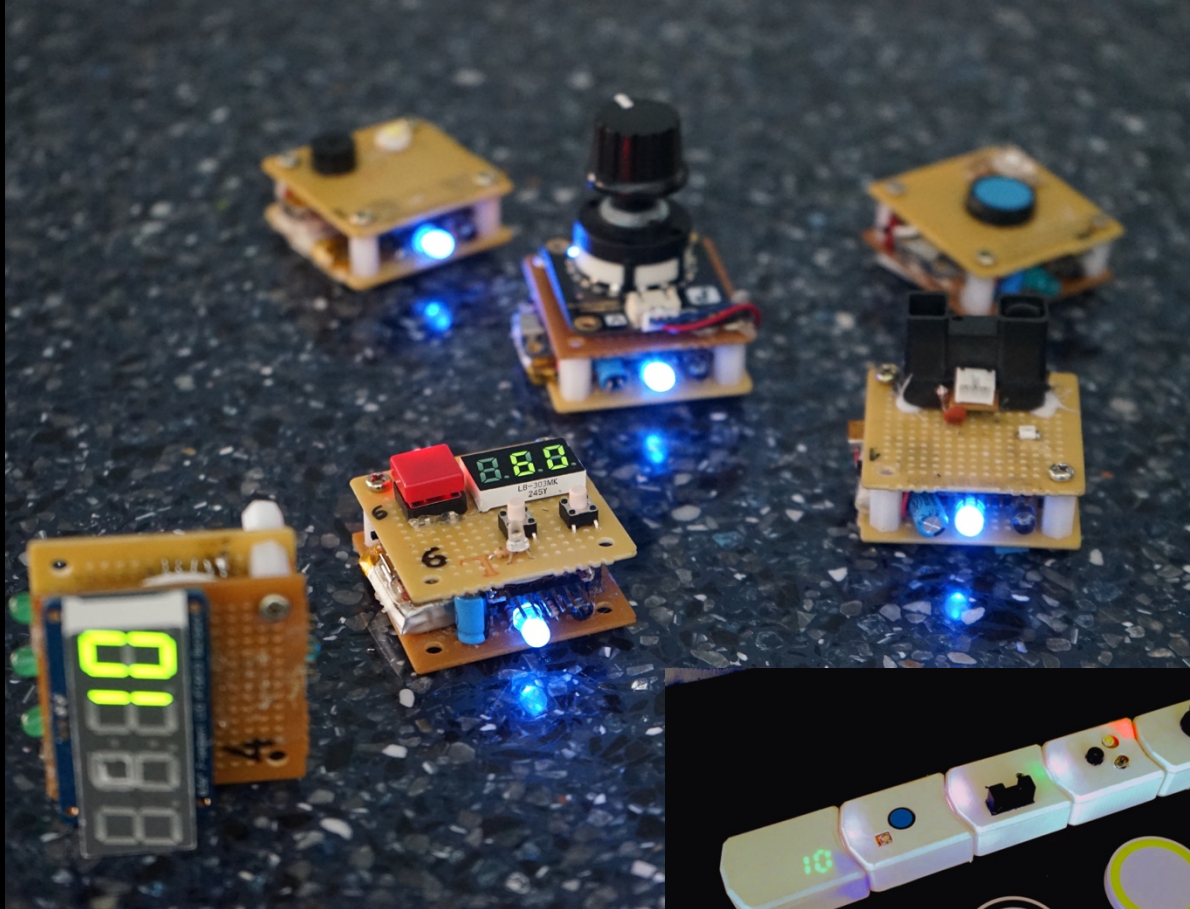


Note:

- this miniature device would be also ideal for more “smart” kind of Haptic Radar.



4) GLUONS: a distributed electronic construction kit



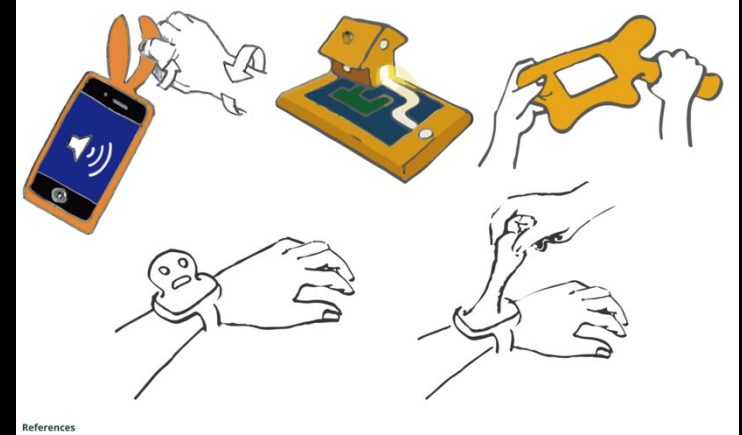
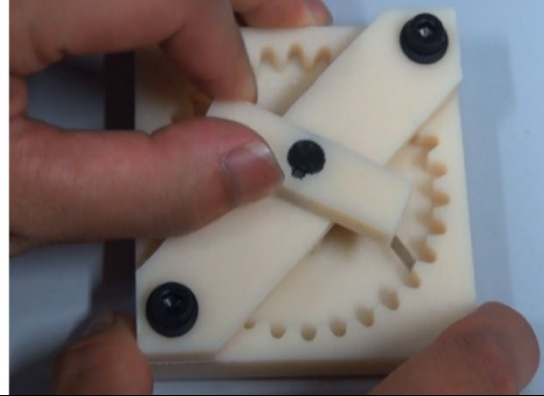
<https://www.alvarocassinelli.com/gluons/>

A hand is shown holding a small, yellow, rectangular module against a dark, textured asphalt surface. The module has a small black circular feature on its top surface. The lighting is soft, highlighting the hand and the module against the dark background.

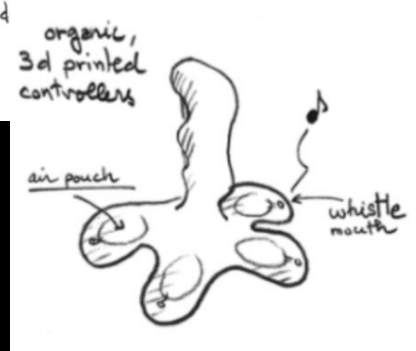
introducing the **modules**

Note: Machine learning and Acoustic/Optical "Phidgets"

... interesting design space (electronic decoupled with case)



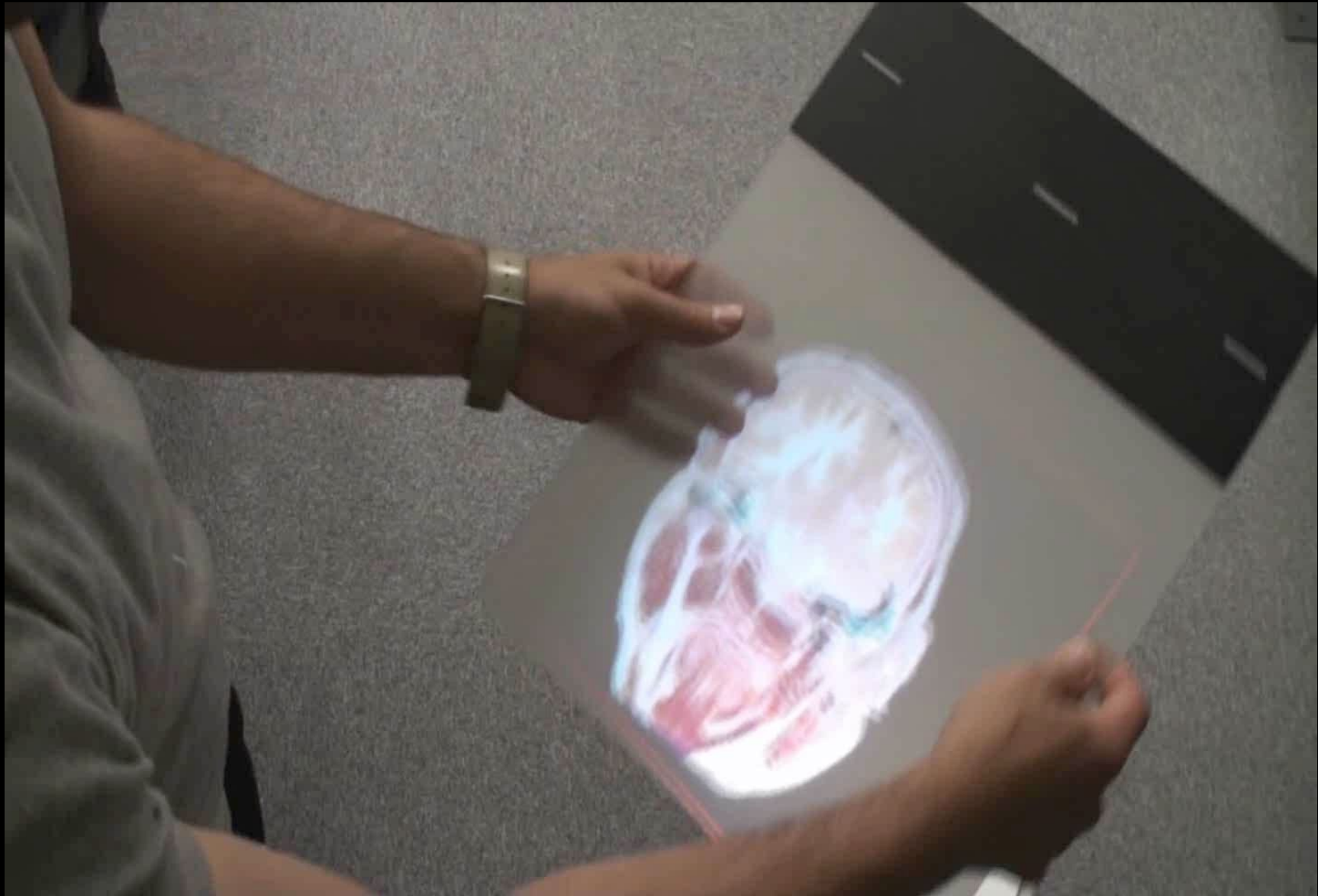
<https://www.alvarocassinelli.com/3077-2/>



<https://www.alvarocassinelli.com/acoustic-phidgets-untethered-passive-controllers-from-acoustic-signatures/>

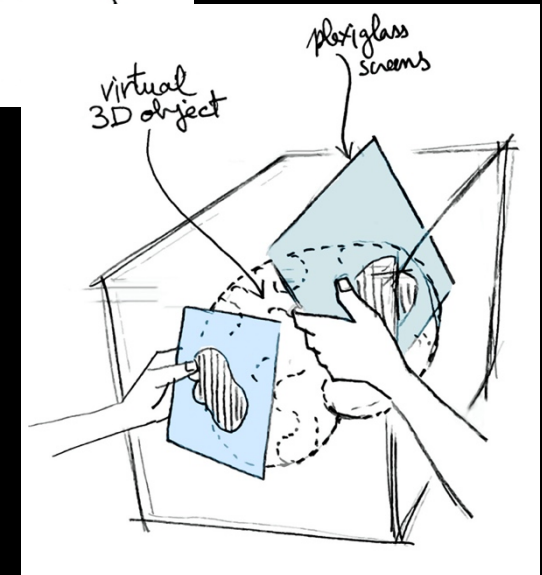
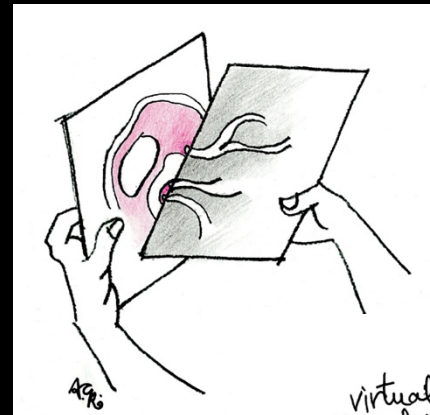
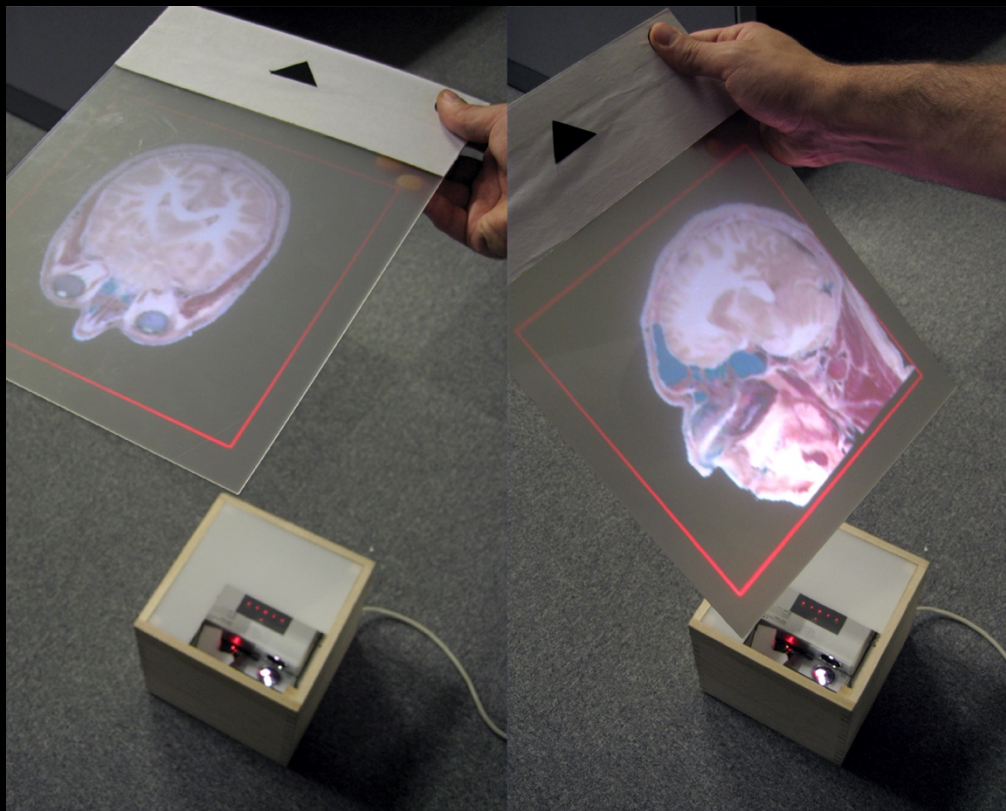


5) VOLUME SLICING DISPLAY: anatomy teaching



www.alvarocassinelli.com/volume-slicing-display/

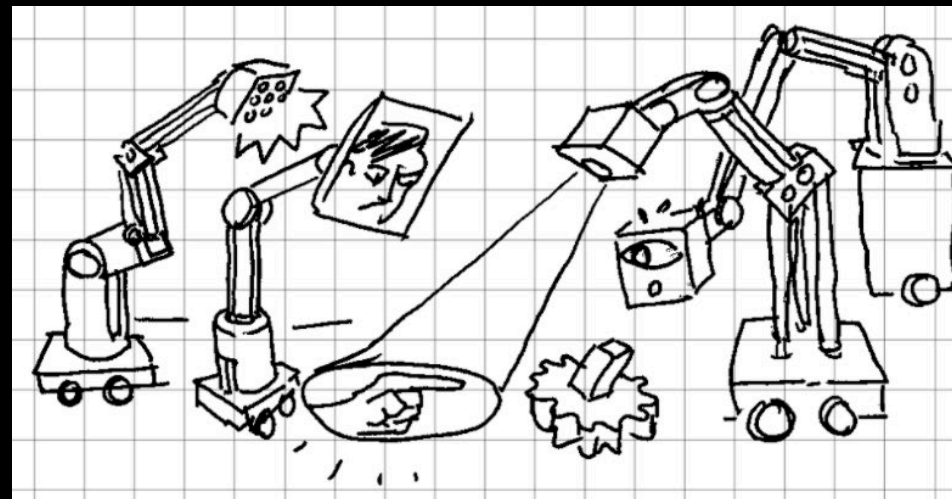
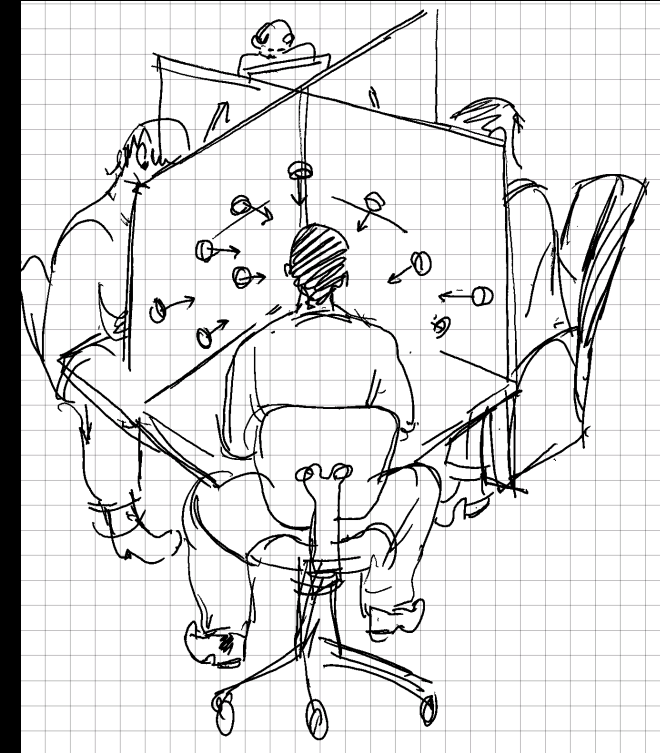
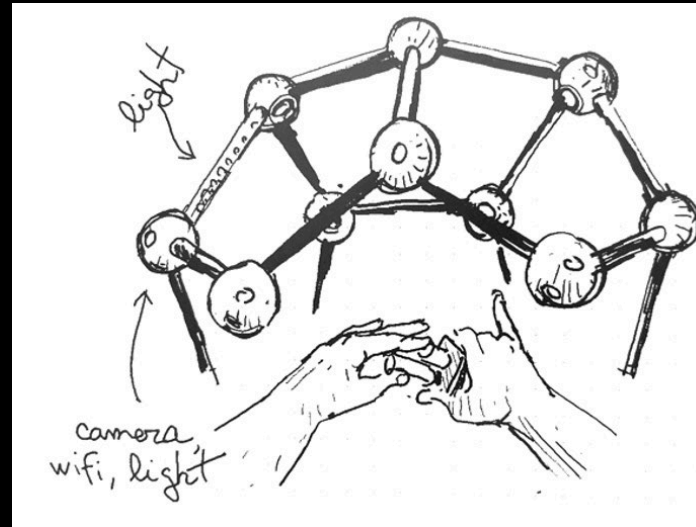
<http://ishikawa-vision.org/perception/VolumeSlicingDisplay/index-e.html>

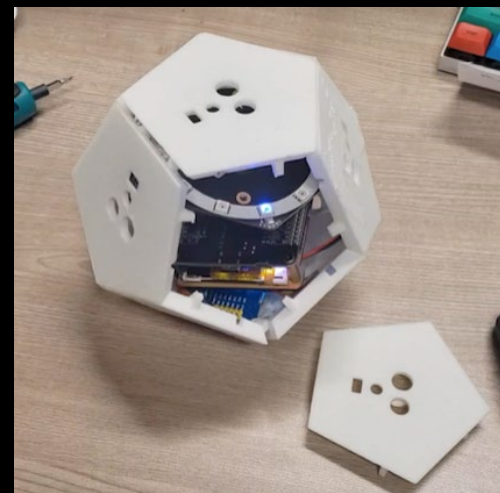
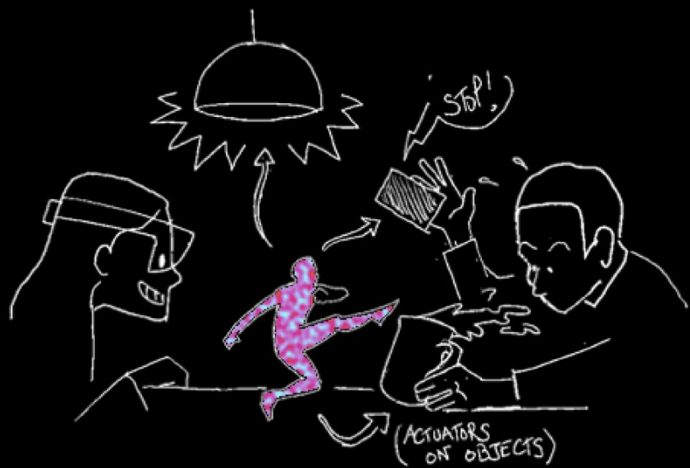
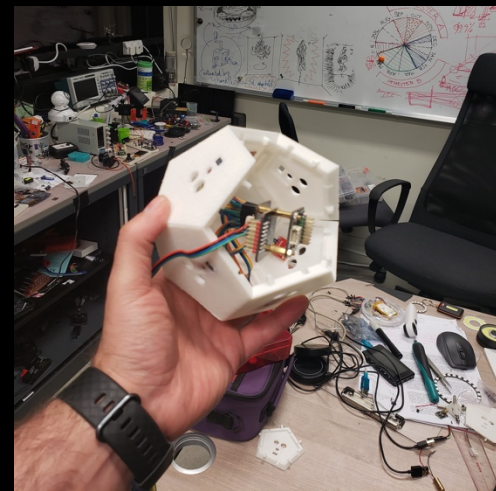
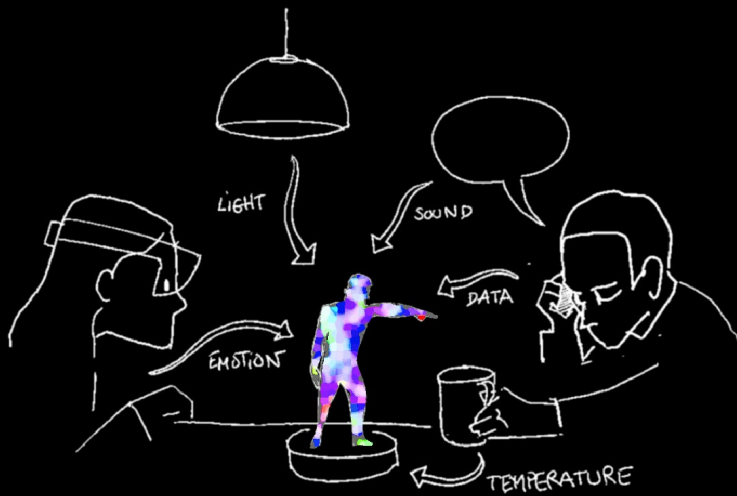


Notes:

The display is a passive piece of paper/plexiglass
Old technology (retroreflective markers): today it would be much simpler to develop a system for use in a classroom, with multiple users.

Bonus:
REVERSE PANOPTICON
(VIRTUAL TEACHING AND
LEARNING grant
530.000HKD)





Note: integration with volumetric displays (looking Glass Factory)

Looking-Glass Boxed Lectures

8.9.2020



Cassinelli Alvaro

to Shawn ▾

2:08 PM (1 minute ago) 🚩

ah, and I want to record my lectures for this thing from now on. What is the hardware (point cloud came recommend me to use?)

Imagine a bookshelf that does not contain books, but looking glass blocks, with tiny professors giving le (very black-mirror like). I see all these youtube courses sold physically like that (or borrowed from a lib go back to physical stuff.

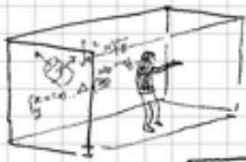
cheers!

Alvaro

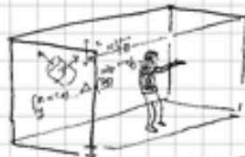
Idea for Shawn v display

→ Uses for teaching:

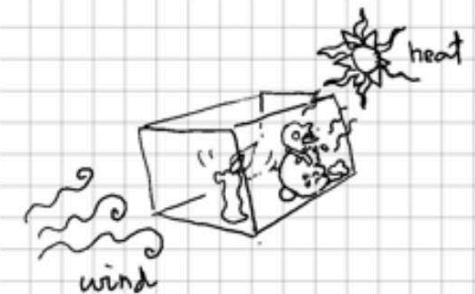
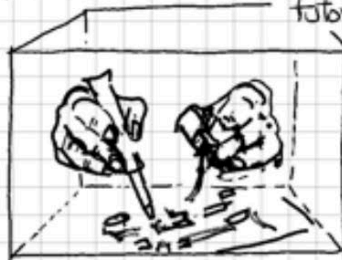
- Recording in 3D:
- close up hands-on



hands-on tutorials



hands-on tutorials



← Tweet



Javier Campos @x_campos · Aug 20

This is me Inside a #lookingglass from @LKGGlass showing my #pointcloud taken from #Kinect @Microsoft Quiet funny!



0:11 659 views



6

14





Thank
you!