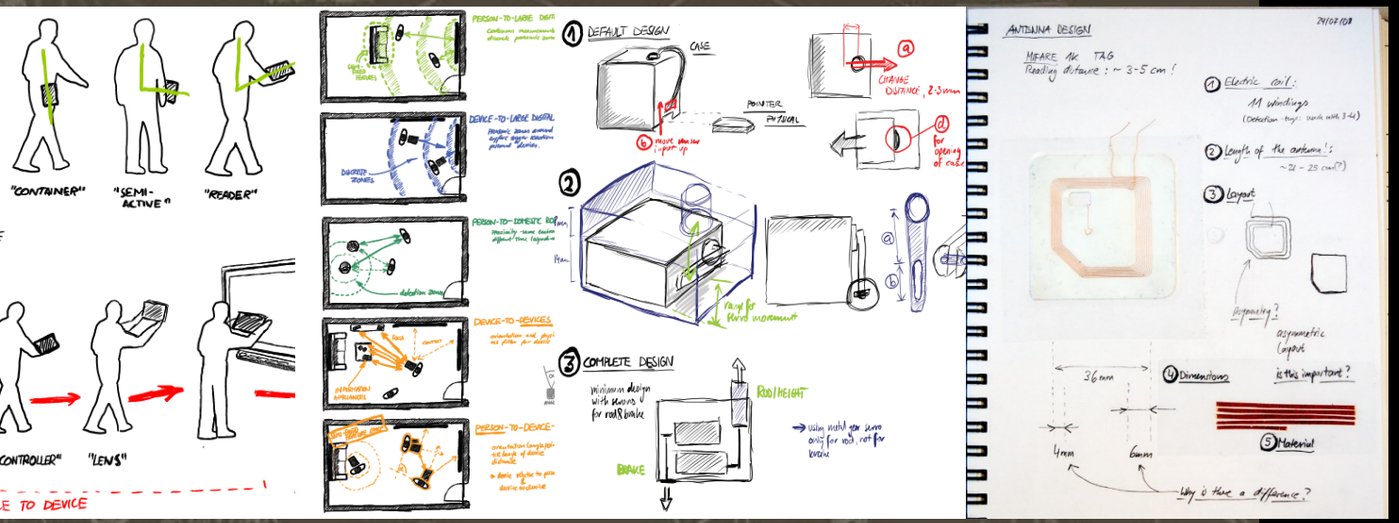
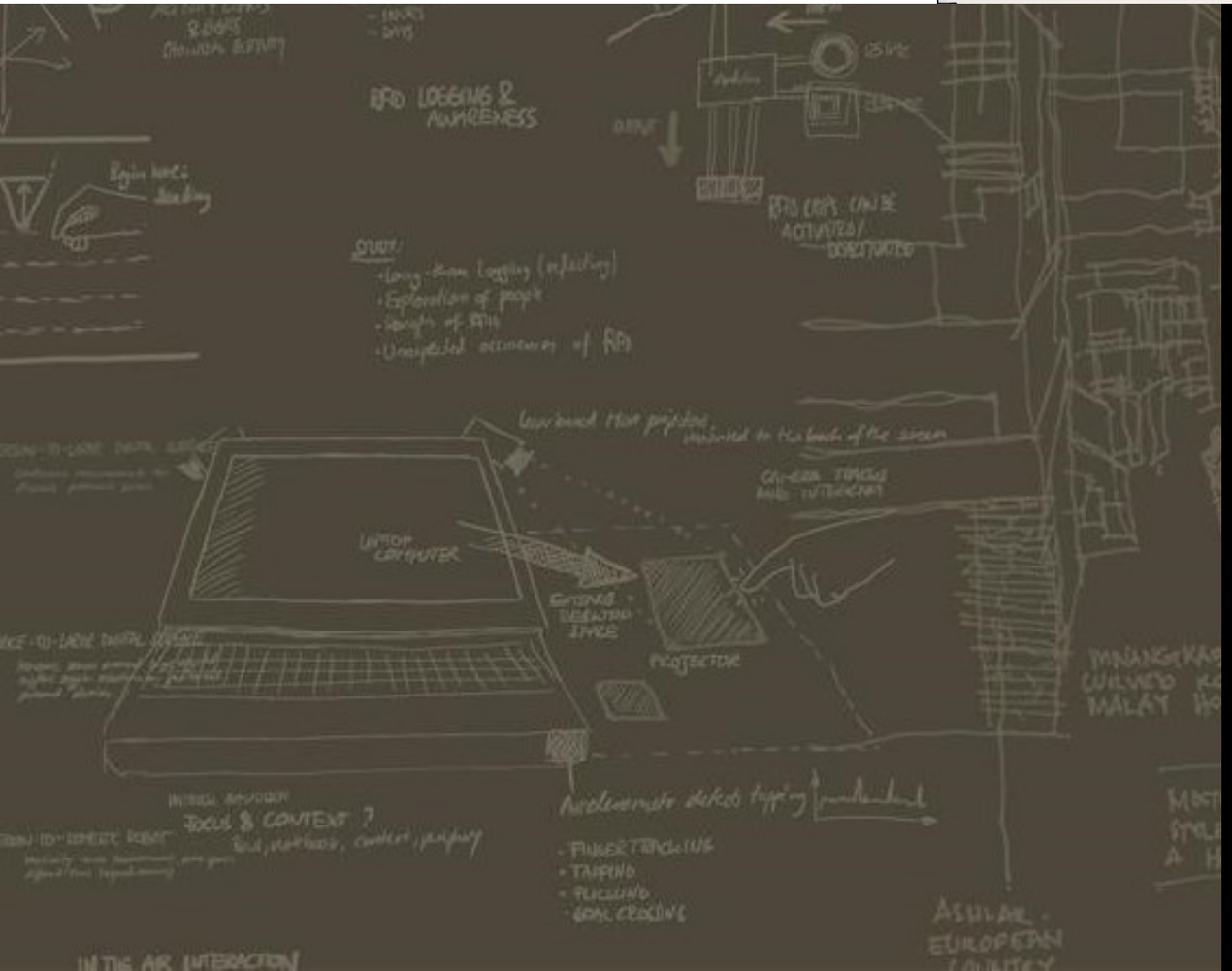




SKETCHING USER EXPERIENCES

STORIES STRATEGIES SURFACES

Nicolai Marquardt

Interactions Lab | University of Calgary
Guest lecture at LMU Munich, April 2013

SKETCHING USER EXPERIENCES

SKETCHING USER
EXPERIENCES

STORIES
STRATEGIES
SURFACES

SKETCHING USER
EXPERIENCES

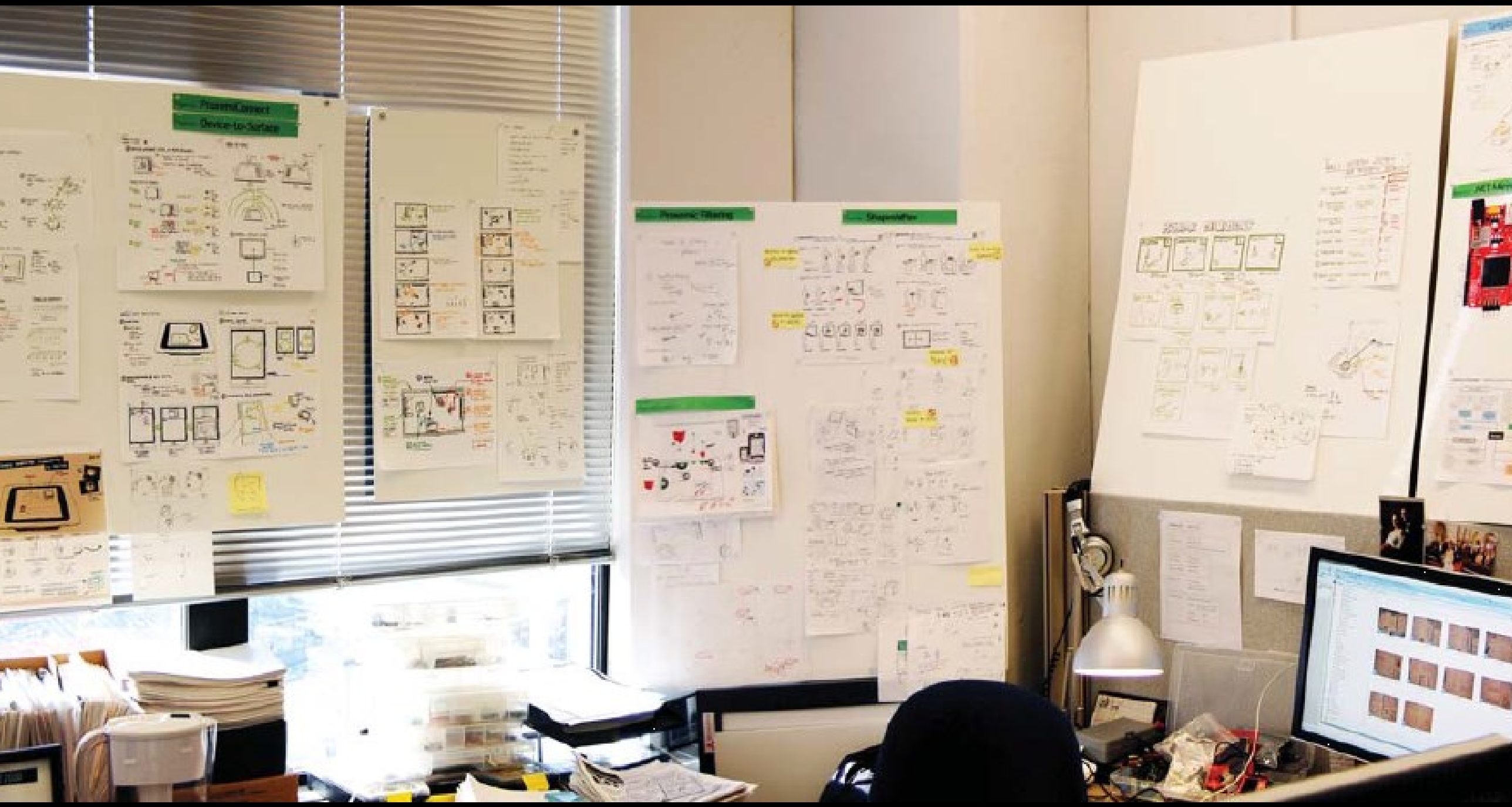
STORIES
STRATEGIES
SURFACES

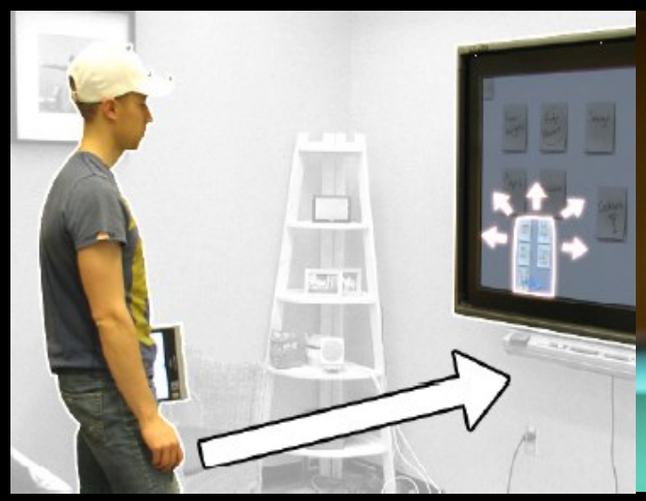
SKETCHING USER
EXPERIENCES

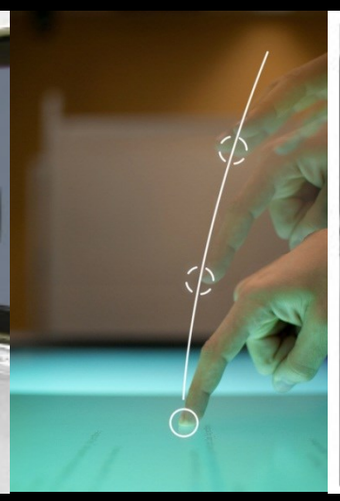
STORIES
STRATEGIES
SURFACES

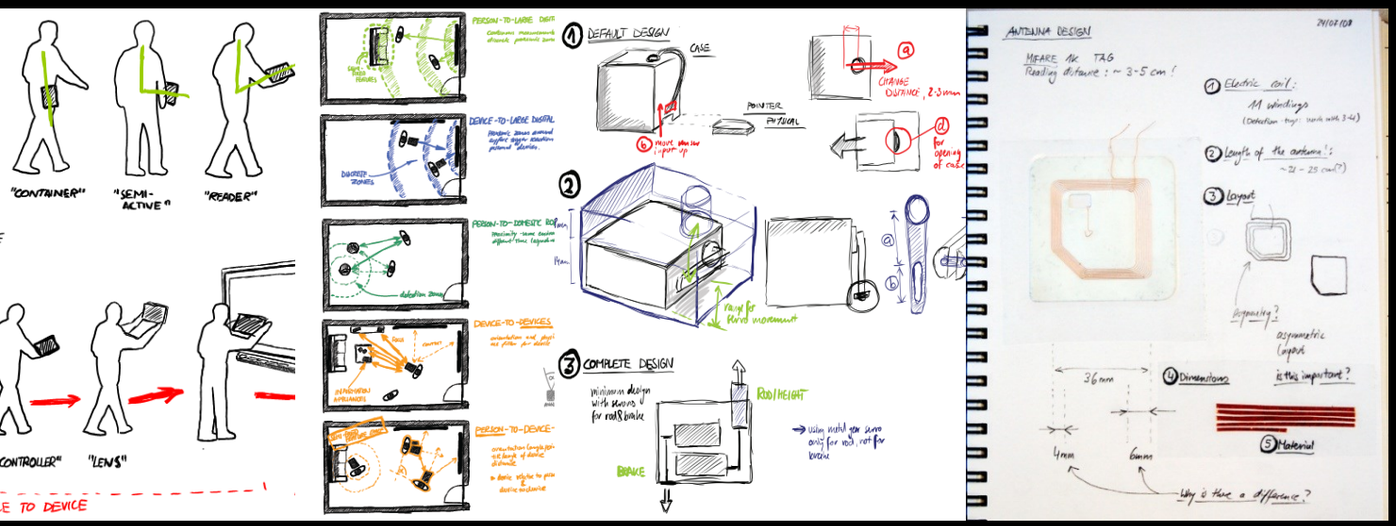
SKETCHING USER
EXPERIENCES

STORIES
STRATEGIES
SURFACES

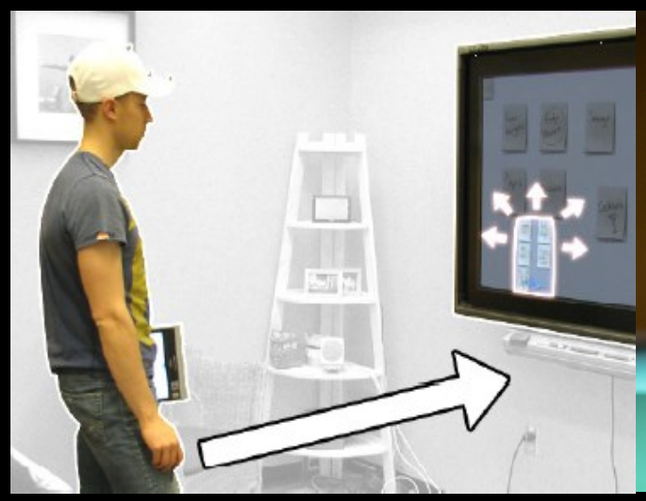

PlasmaConnect
Device-to-Surface

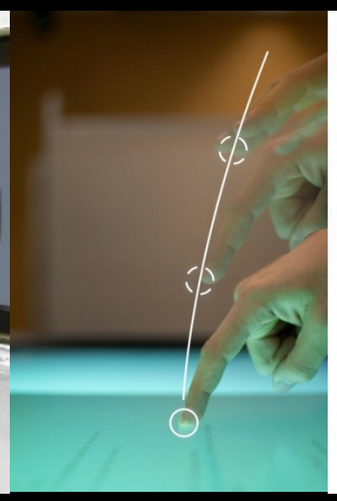





"CONTAINER"
"SEMI-ACTIVE"
"READER"
"CONTROLLER"
"LENS"
E TO DEVICE
PERSON-TO-LARGE DIGIT
DEVICE-TO-LARGE DIGIT
PERSON-TO-DOMESTIC ROOM
DEVICE-TO-DEVICES
PERSON-TO-DEVICE
1 DEFAULT DESIGN
CASE
POINTER
PATTERN
CHANGE DISTANCE, 2-3mm
2
3 COMPLETE DESIGN
minimum design with sensors for roll&brake
ROD/HEIGHT
BRAKE
→ using motor for servo only for roll, not for brake

ANTENNA DESIGN
21/07/10
MEARE NL TAG
Reading distance: ~ 3-5 cm !
1 Electric coil:
11 windings
2 Length of the antenna!:
~21 - 25 cm(?)
3 Layout
Symmetry?
asymmetric layout
36 mm
4 Dimensions
is this important?
5 Material
4mm
6mm
Why is there a difference?





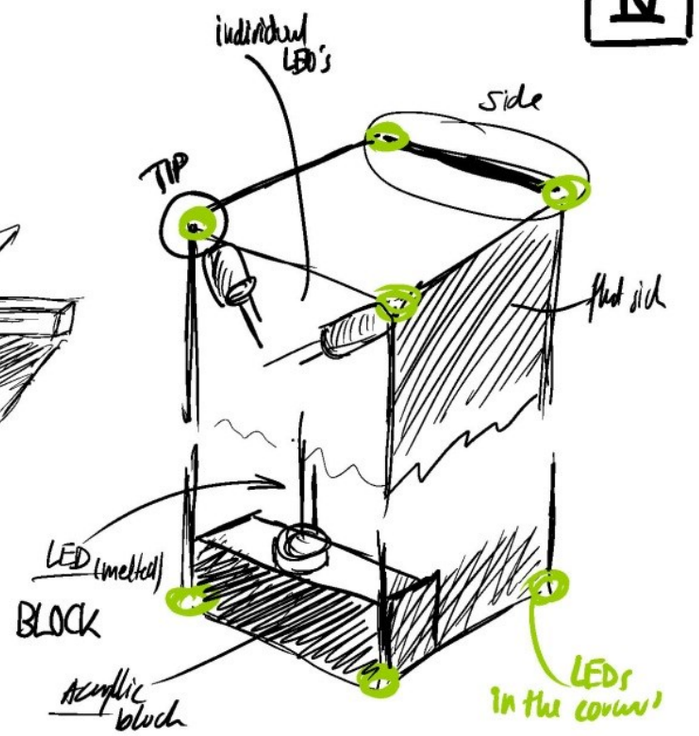
hands-on sketching throughout the talk

filling the blank page...

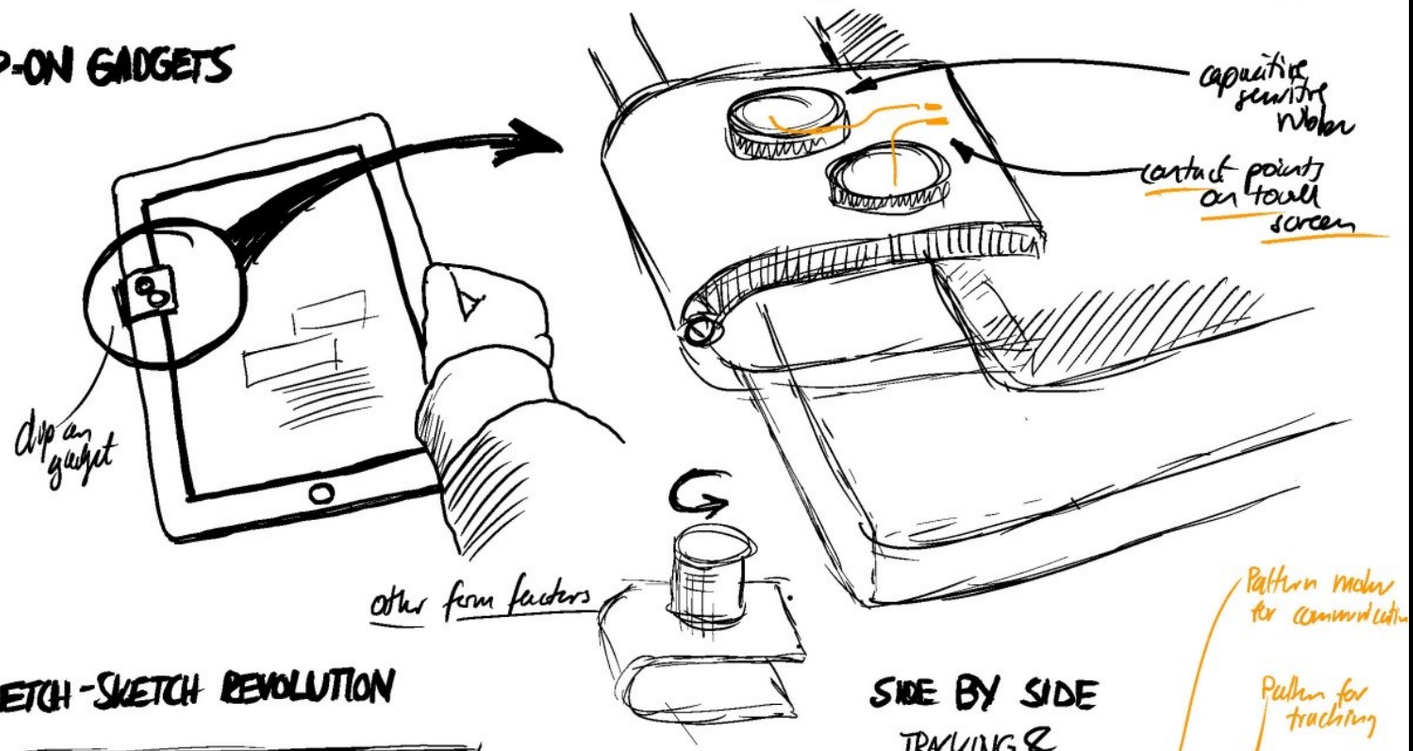
UIST CONFERENCE 2011

IV

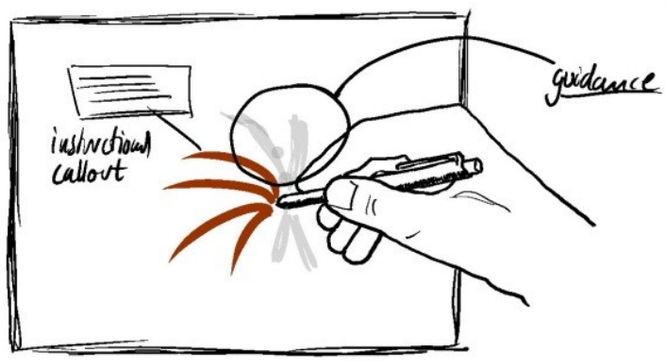
CONTÉ (Daniel Vogel)



CLIP-ON GADGETS

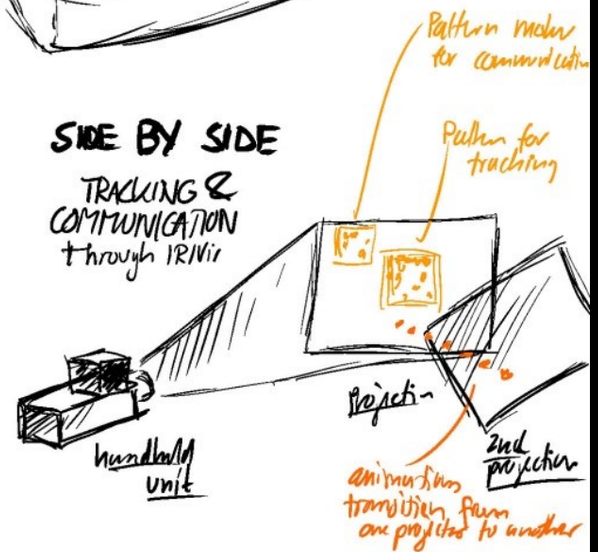


SKETCH-SKETCH REVOLUTION

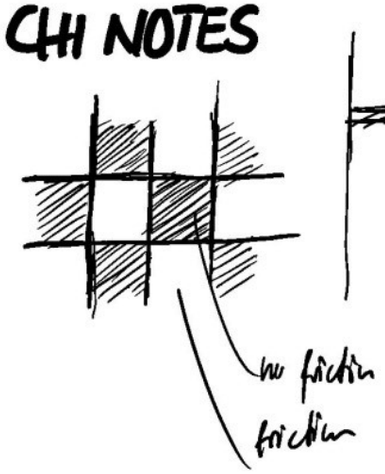


SIDE BY SIDE

TRACKING & COMMUNICATION through IR/Vis



CHI NOTES



3 conditions
- constant high friction
- " low friction
- variable friction

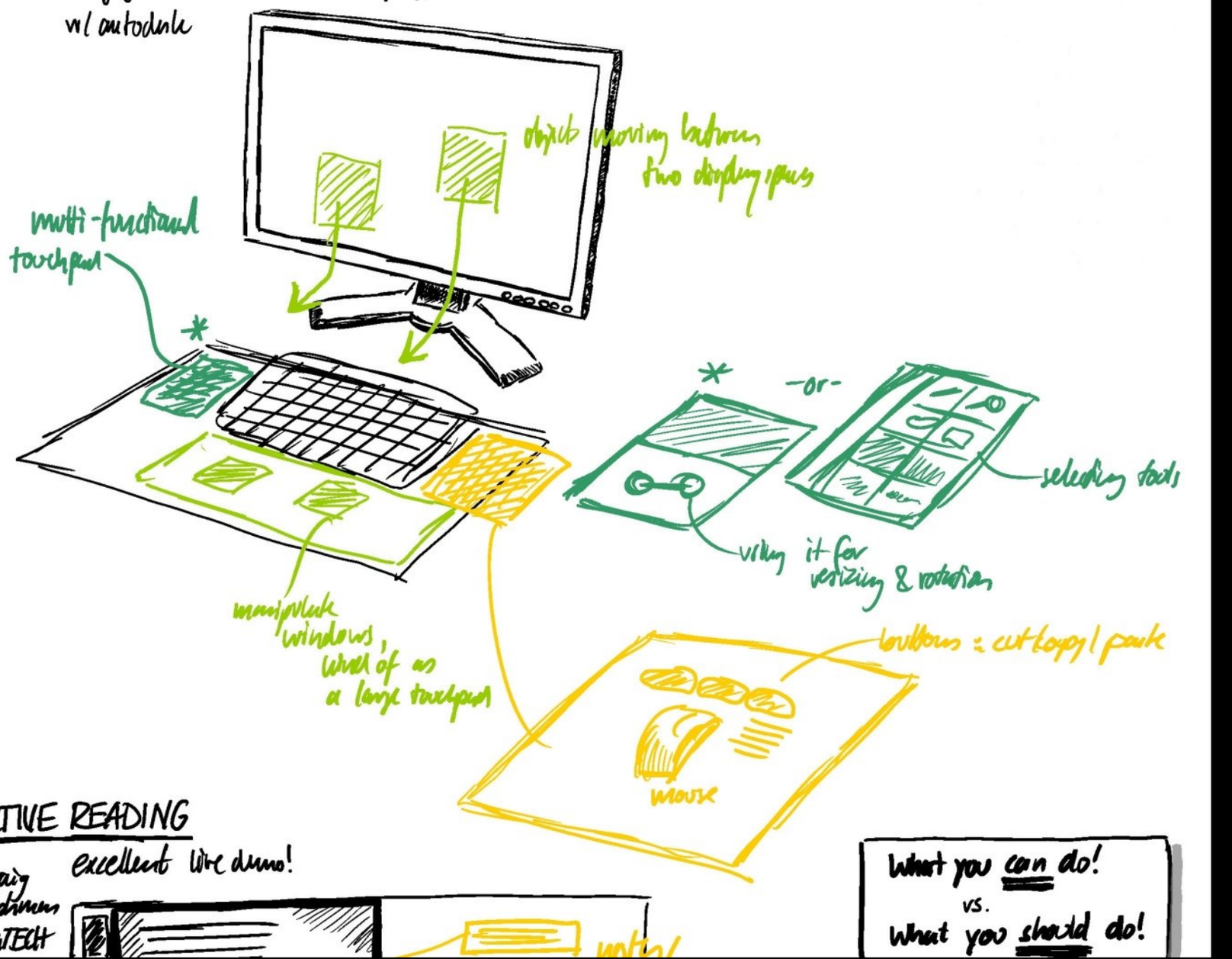
uses high-frequency vibration to give the impression of increased or decreased friction..

3 studies overall
+ User engagement study

Future work
- Taxonomy of sensations
- Mapping to widgets

MAGIC DESK

Bringing touch interaction to desktop applications w/ an trackpad



ACTIVE READING

Craig Tashman GaTech

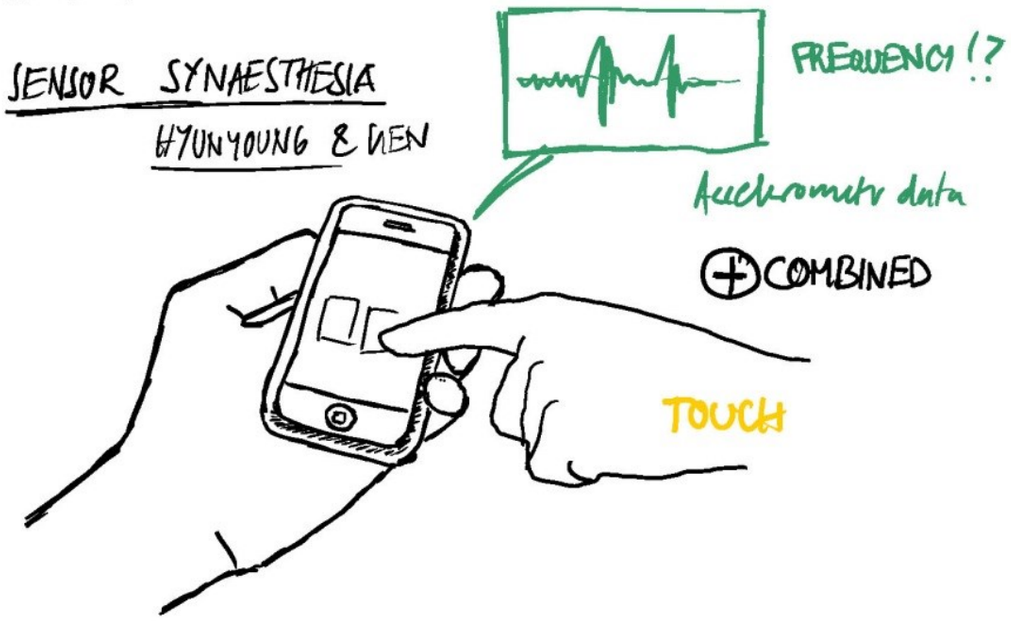
excellent live demo!

What you can do!
vs.
What you should do!

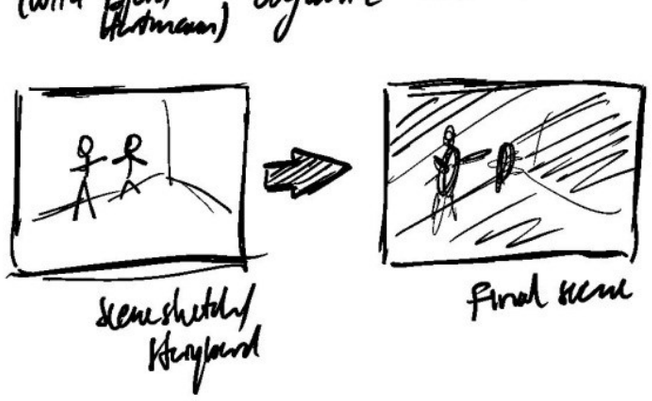
CHI NOTES

SENSOR SYNAESTHESIA

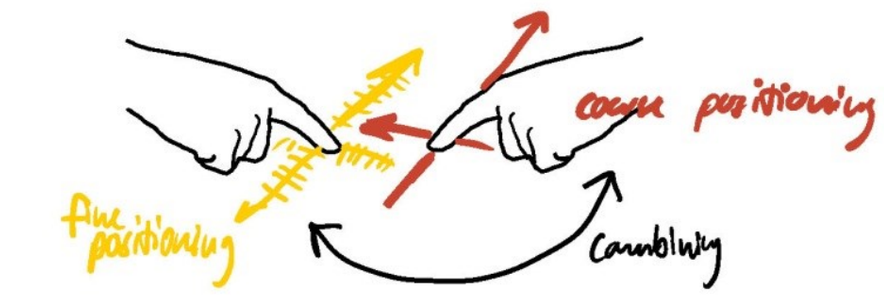
HYUNYOUNG & EDEN



EDEN: Multitouch tool for constructing virtual organic environments (with Björn Hartmann)



Imprecision of multitouch: → Organic environment vs. man-made ones

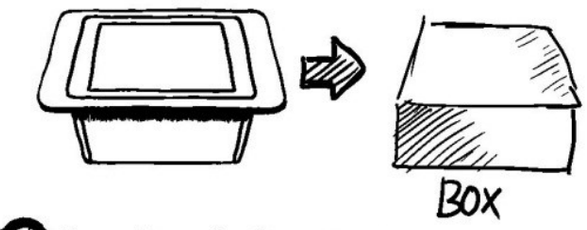


→ Expert evaluation

DESCRIBE OBJECTS FROM GESTURES

CHRIS HOLZ & ANDY

(1) Often describe into PRIMITIVES



(2) Showing top3 objects

(3) Use timing to remove transition gestures

Ideas: - differences between cultures?

- what about providing feedback?

Design Principles

(I) one gesture at a time
→ difficult for artist to use multiple, simultaneous gestures

(II) Split gestures across hands

(III) Simple gestures to frequent operations

(IV) Motion reflects operation

(V) Control at most two parameters

(VI) Incorporate indirect manipulation

(VII) Avoid long traversals

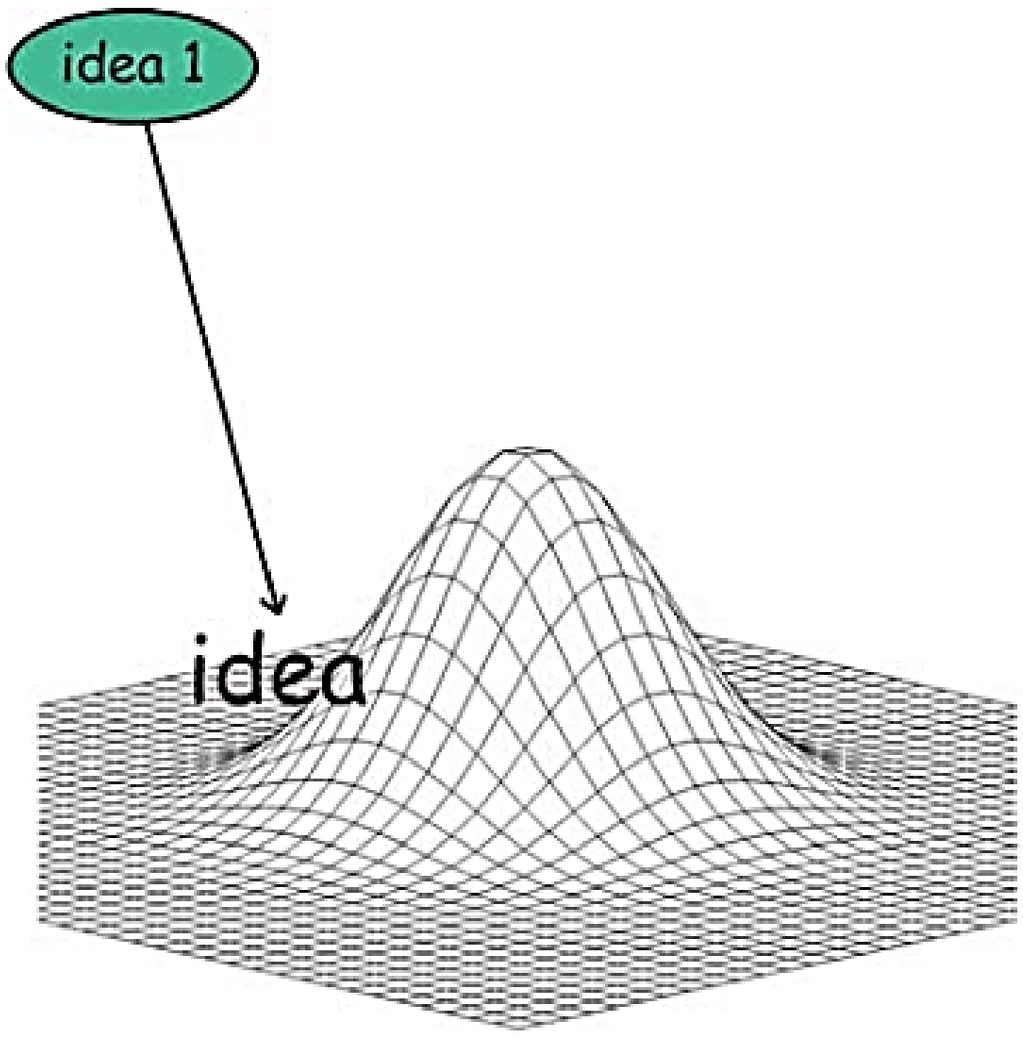
Definition of Sketching

getting the design right vs.

getting the **right design**

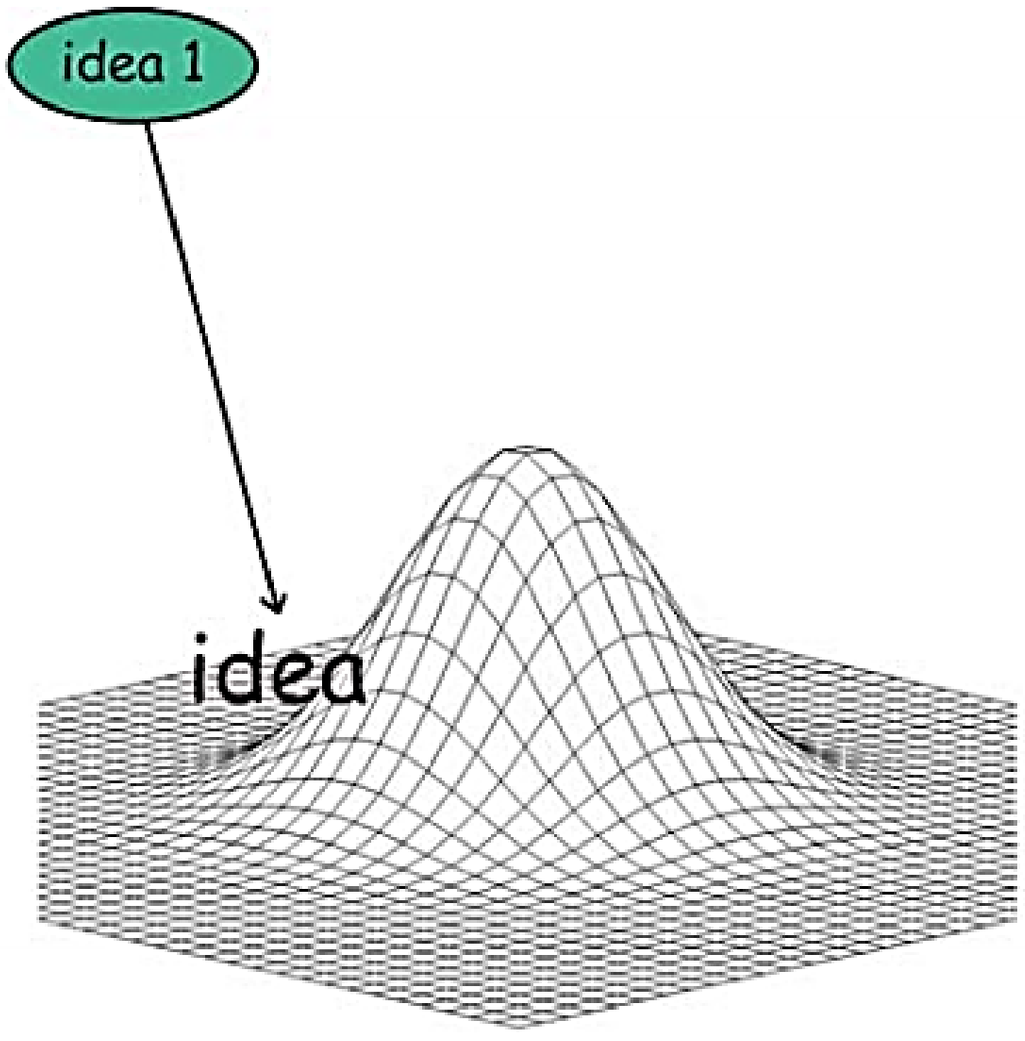
Bill Buxton

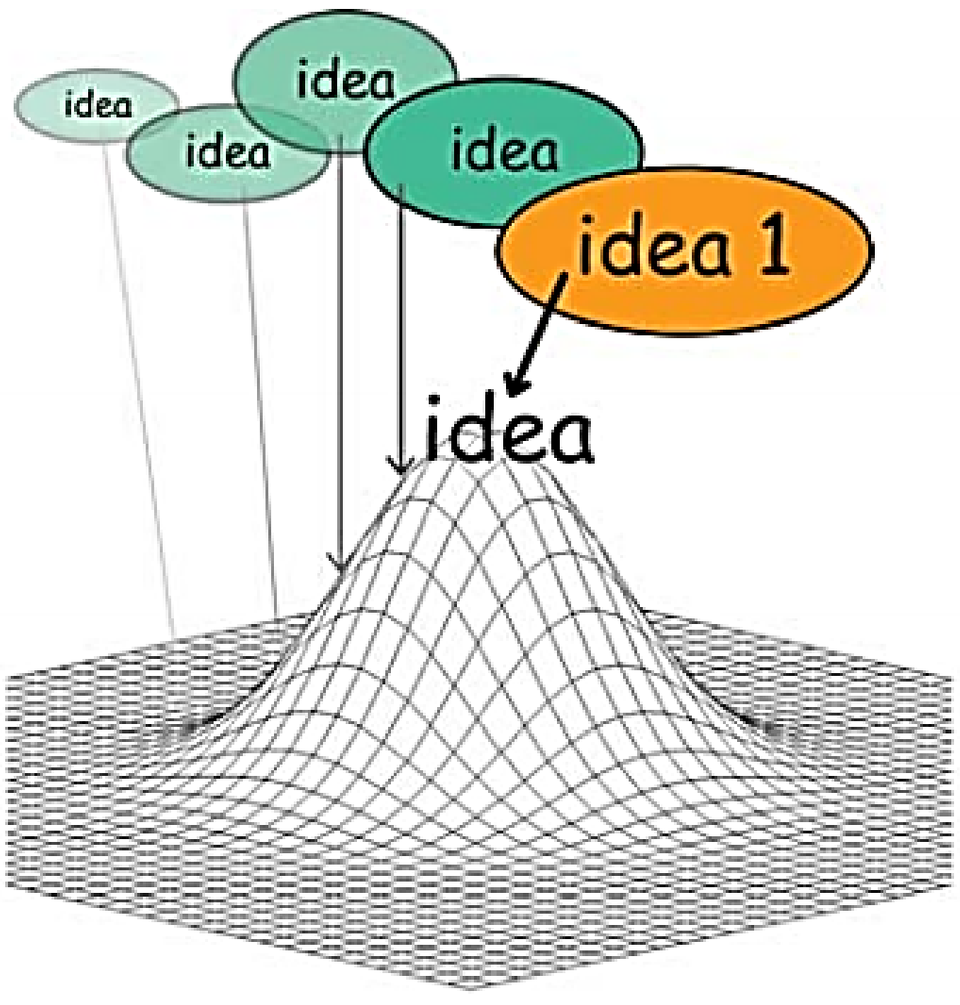
Getting the design right



Greenberg et al. [2]

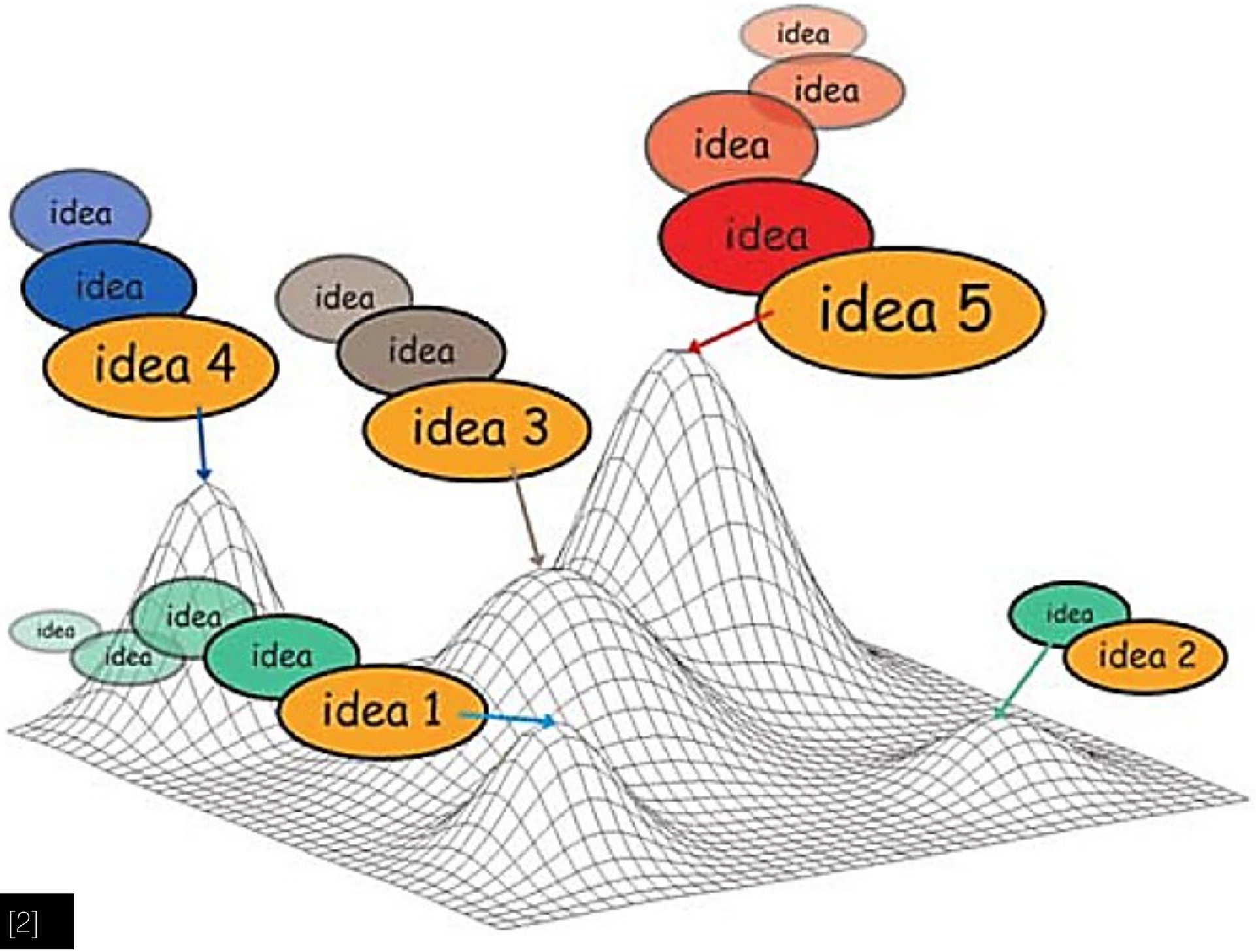
Getting the design right





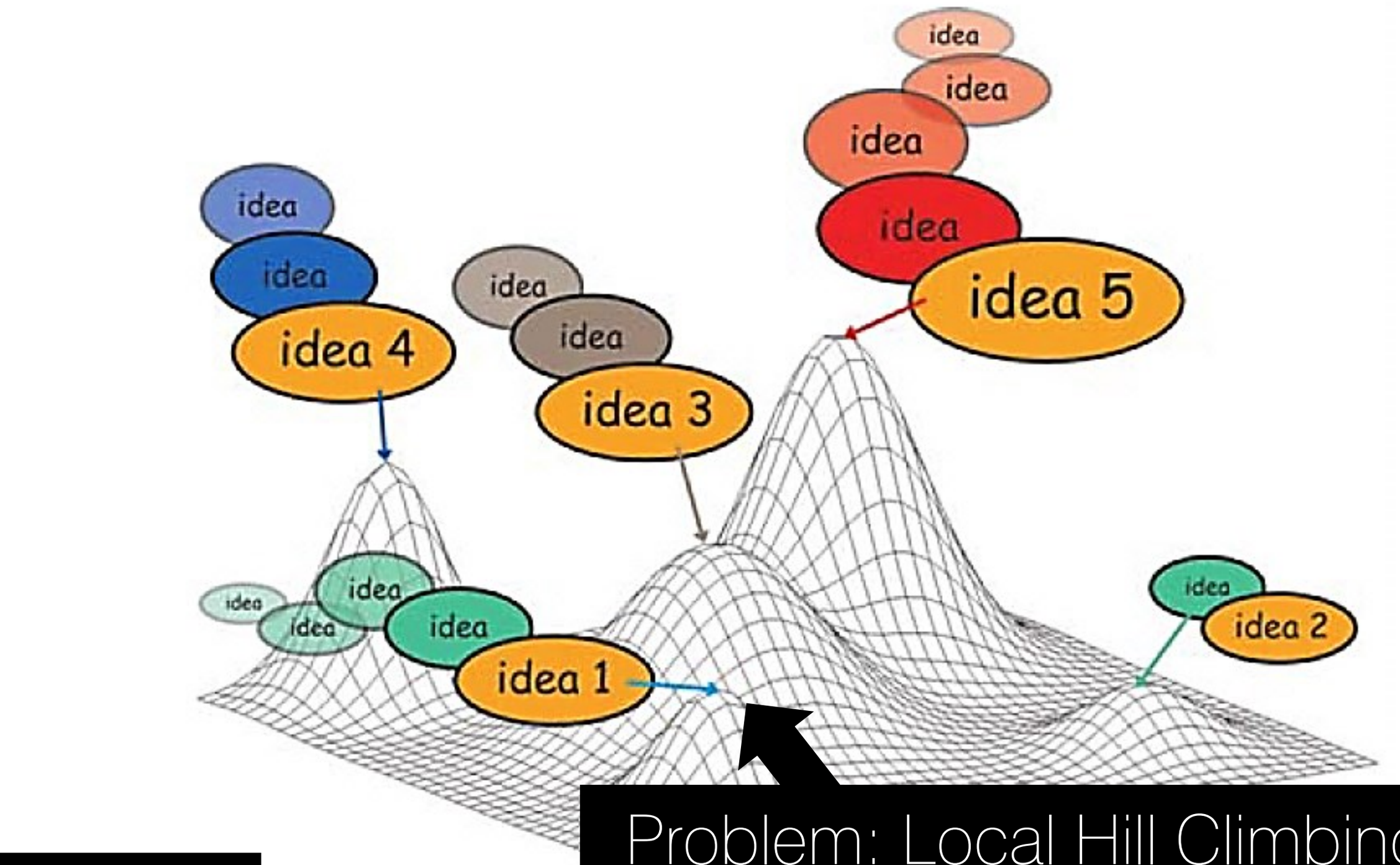
Greenberg et al. [2]

Instead: **Getting the right design**



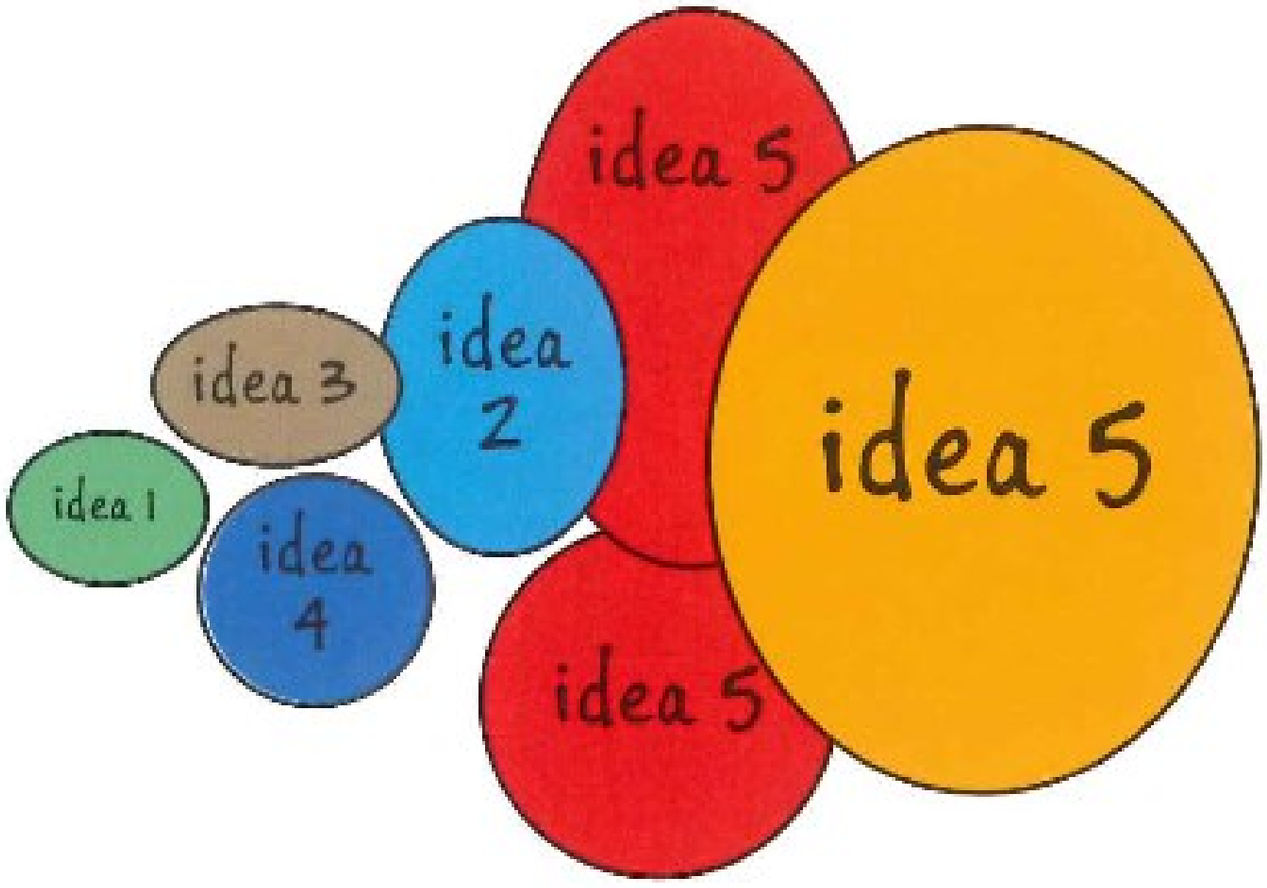
Greenberg et al. [2]

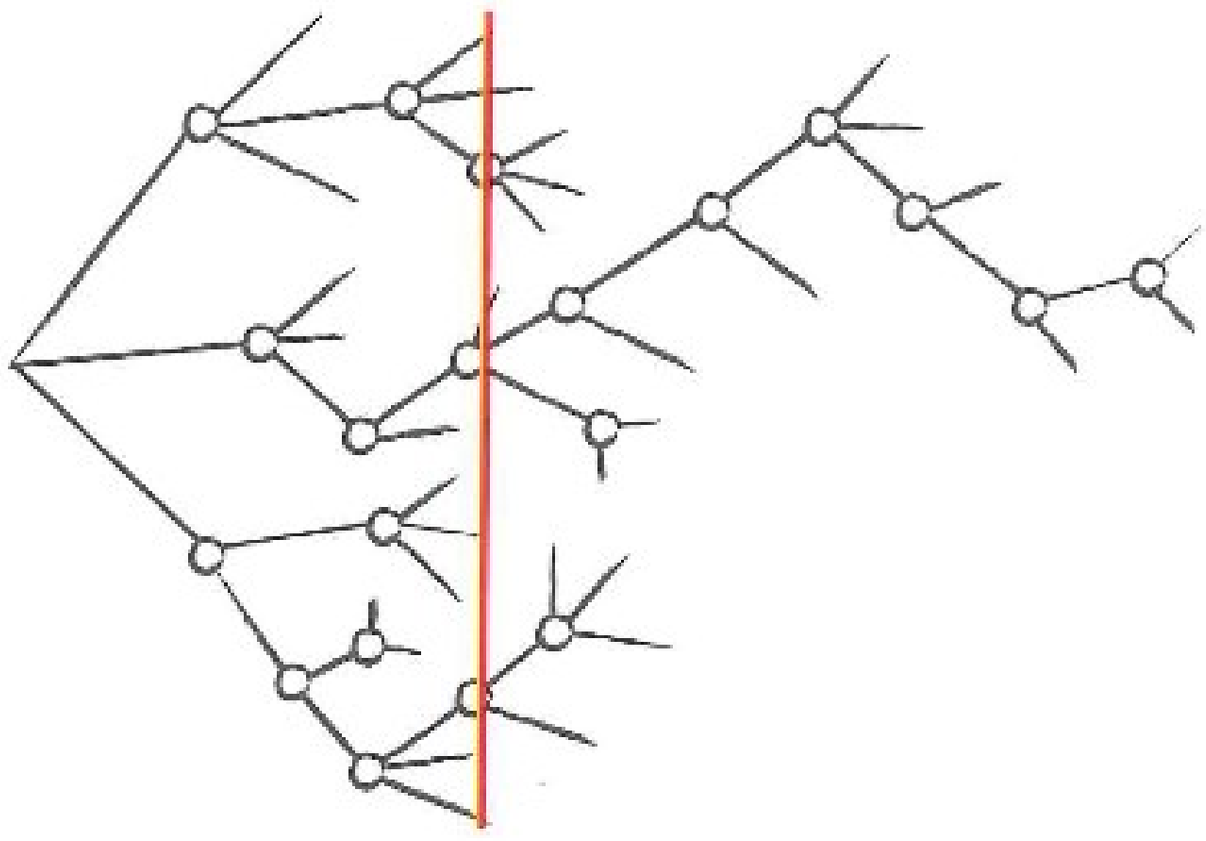
Instead: **Getting the right design**



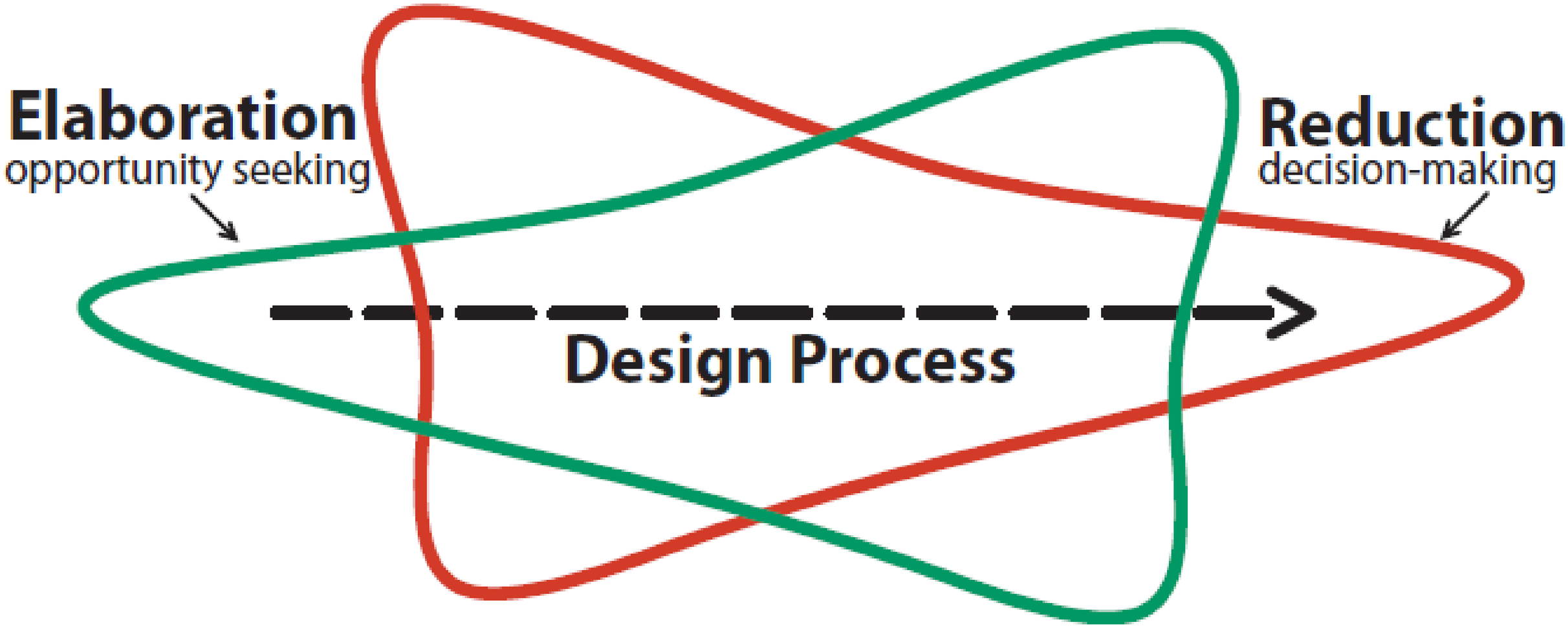
Problem: Local Hill Climbing

Greenberg et al. [2]

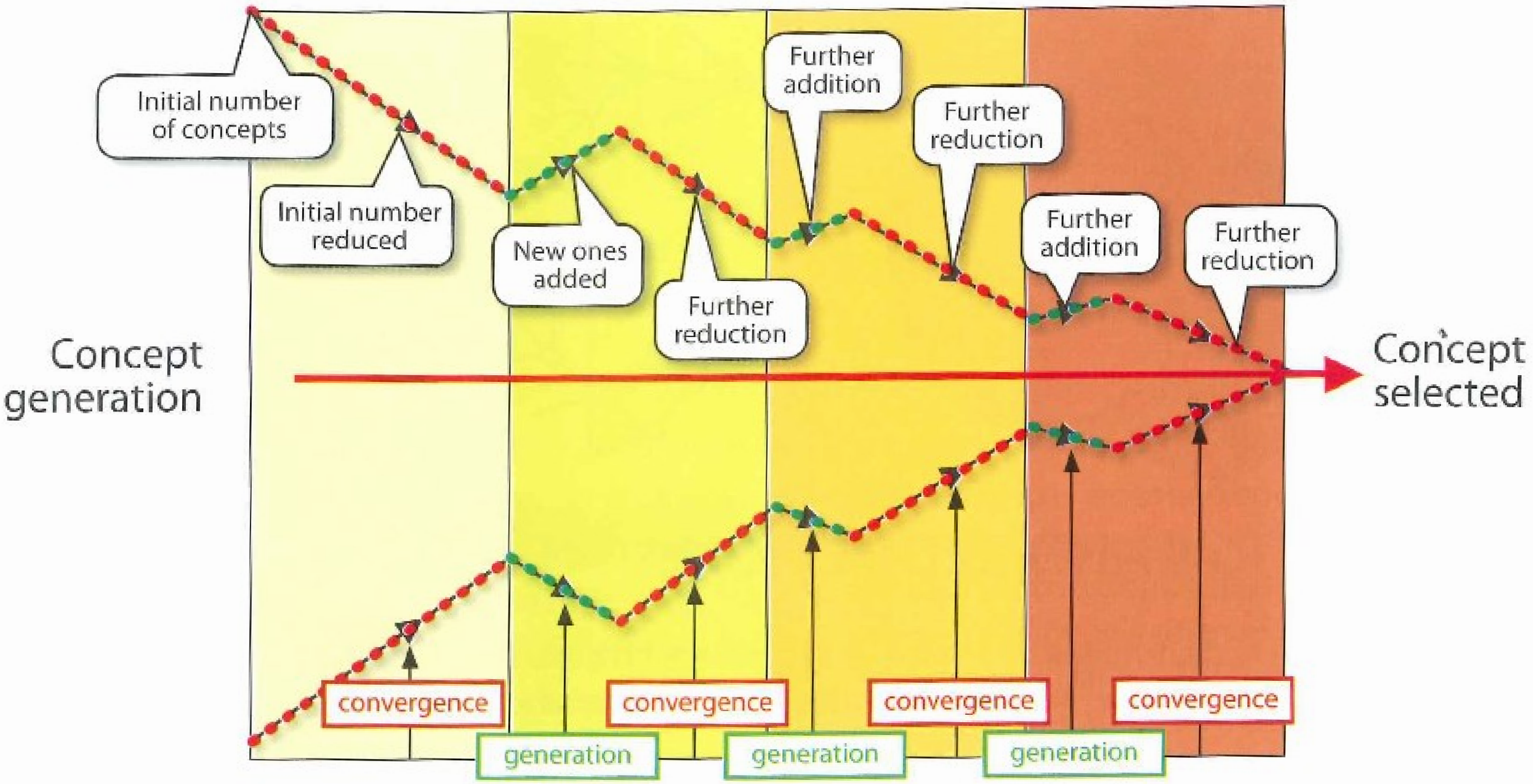




Greenberg et al. [2]



Greenberg et al. [2]



Iterative:	**General** overall concepts	**Iteration 1** exploratory	**Iteration 2** clarification	**Iteration 3** resolution
Granularity:	**General** overall concepts	**Coarse** significant alternatives	**Medium** intermediate development	**Fine** detailed refinement

Greenberg et al. [2]

Why is sketching useful?

Early ideation

Think through ideas

Force you to visualize how things come together

Communicate ideas to others to inspire new designs

Active brainstorming

Characteristics of Sketches and Sketching

Clear vocabulary

Plentiful

Suggest and explore rather than confirm

Quick and inexpensive

Timely, when needed

Disposable

Minimal detail and distinct gesture

Ambiguous

Appropriate degree of refinement

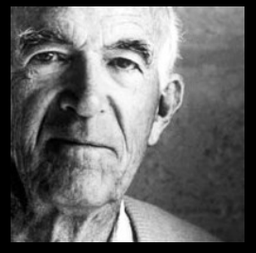
Buxton [1]

A peek into nine inspiring sketchbooks...

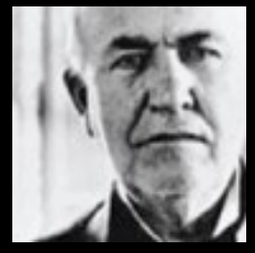
A peek into nine inspiring sketchbooks...



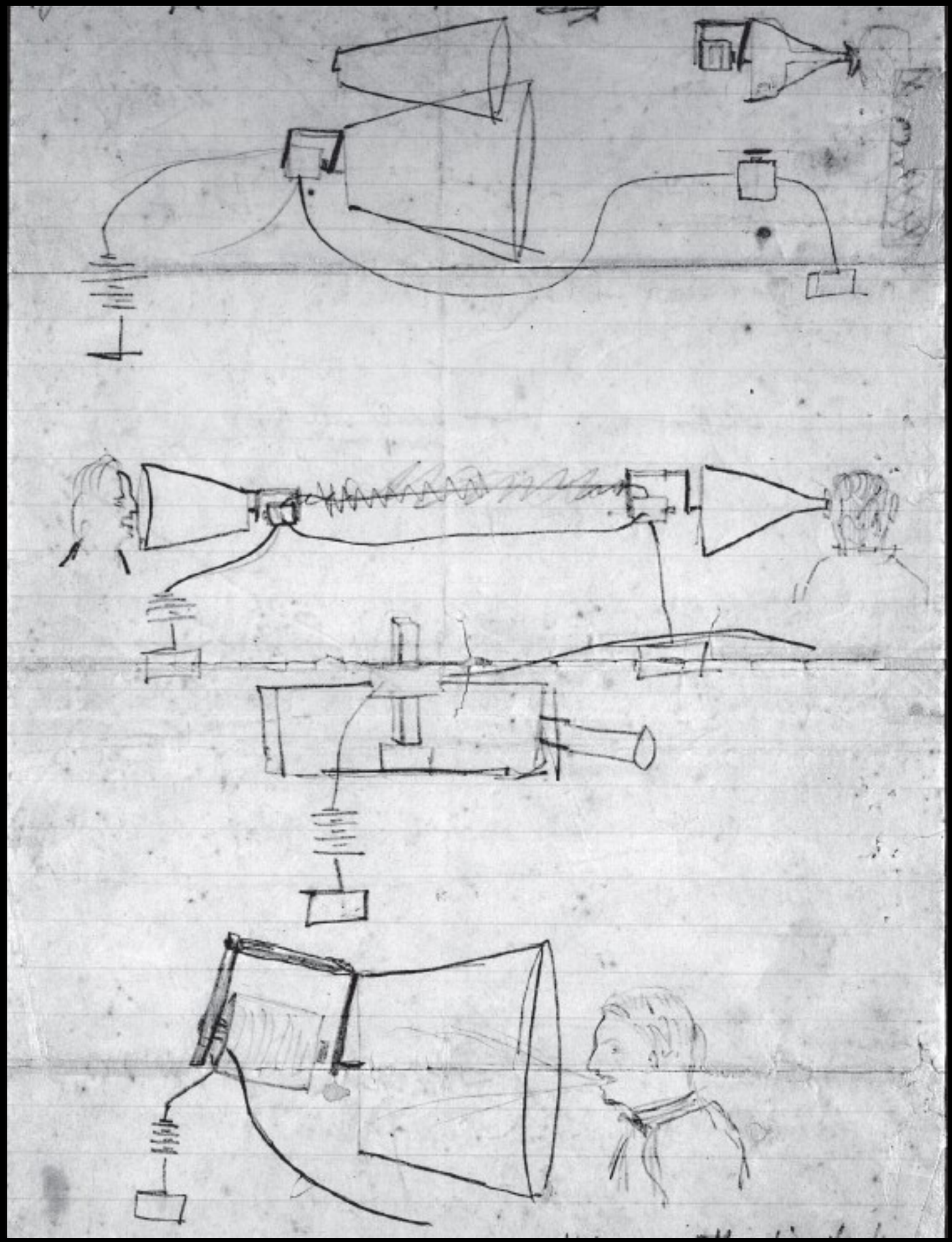








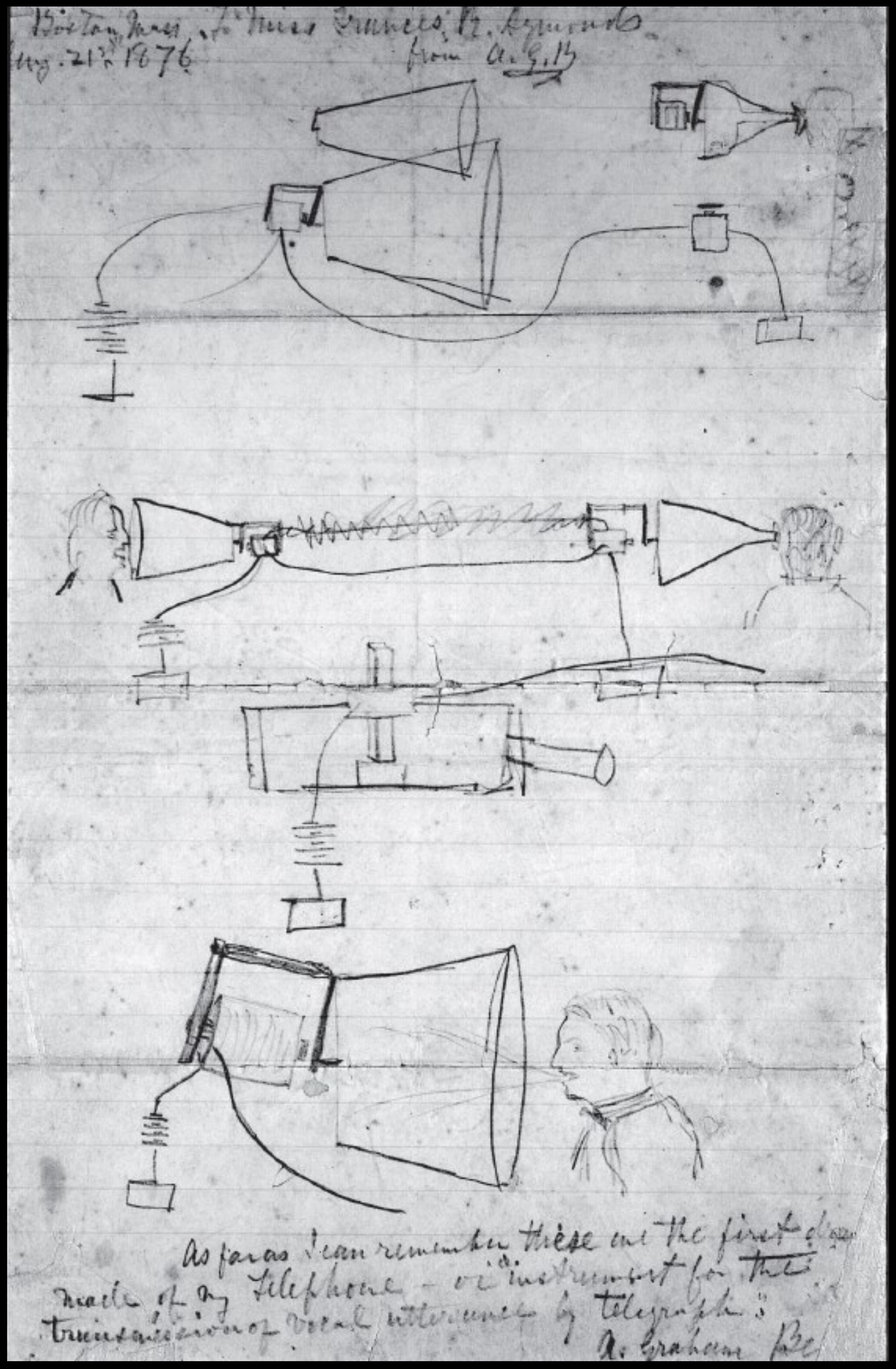
Sketches **do not have to be pretty, beautiful**, or even immediately understandable by others. However, you should be able to **explain your sketches and ideas** when anyone asks about them.



Source: The Library of Congress
http://memory.loc.gov/ammem/bellhtml/bellhome.html/

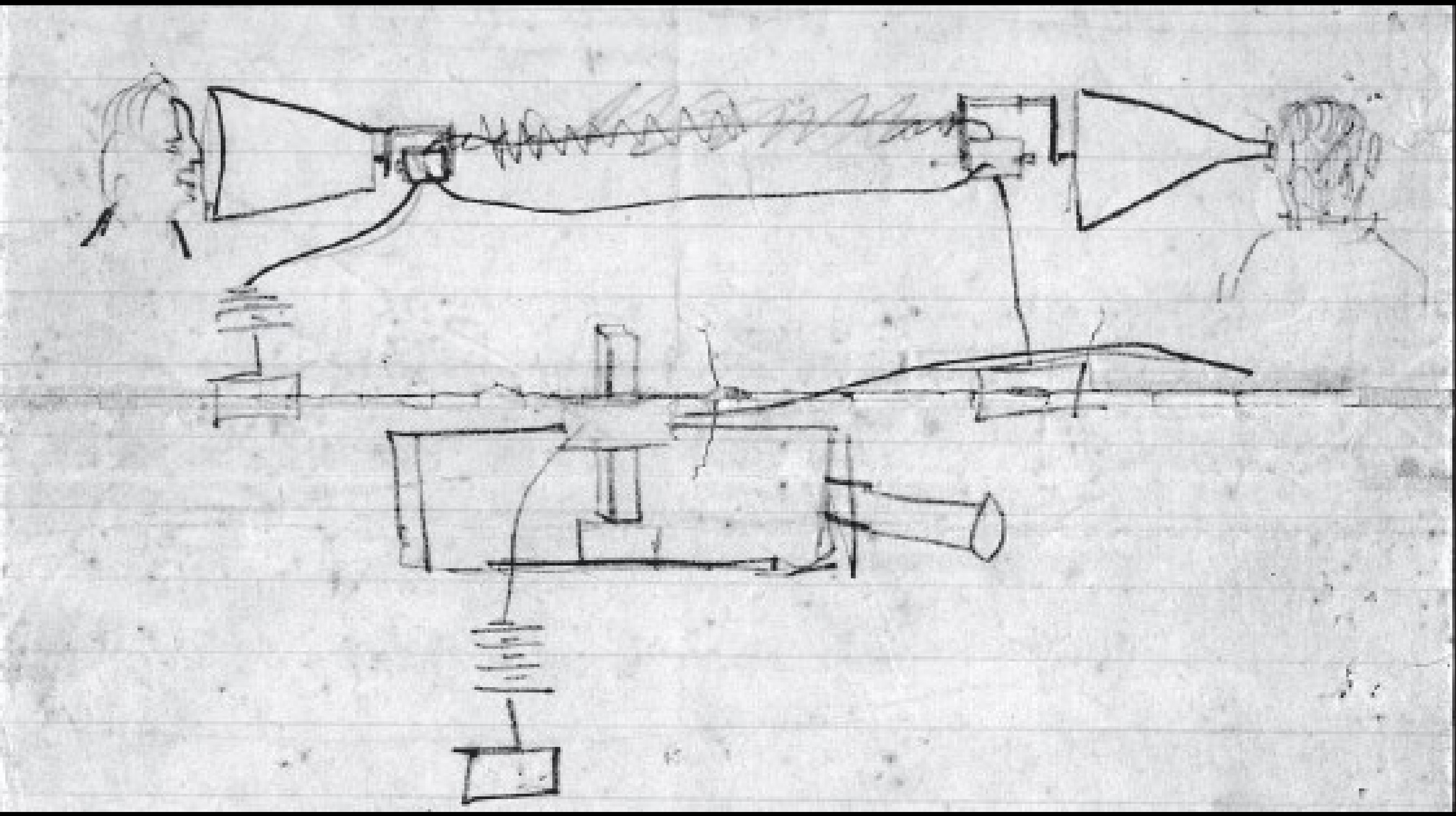
1

Alexander G. Bell | Engineer, Inventor



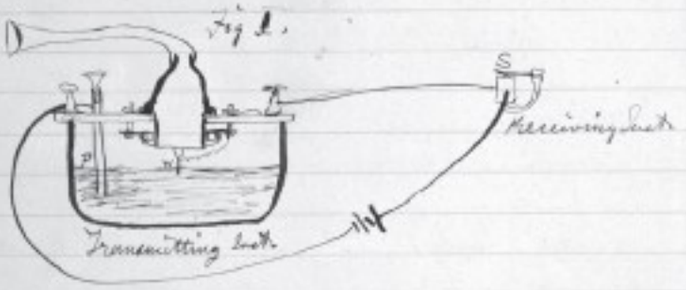
Source: The Library of Congress
http://memory.loc.gov/ammem/bellhtml/bellhome.html/

Source: The Library
of Congress
**http://memory.loc.gov/amm
em/bellhtml/bellhome.html/**



March 10th 1876

Fig 1.



1. The improved instrument shown in Fig. I was constructed this morning and tried this evening. P is a brass pipe and W the platinum wire M the mouth piece and S the armature of the Receiving Instrument.

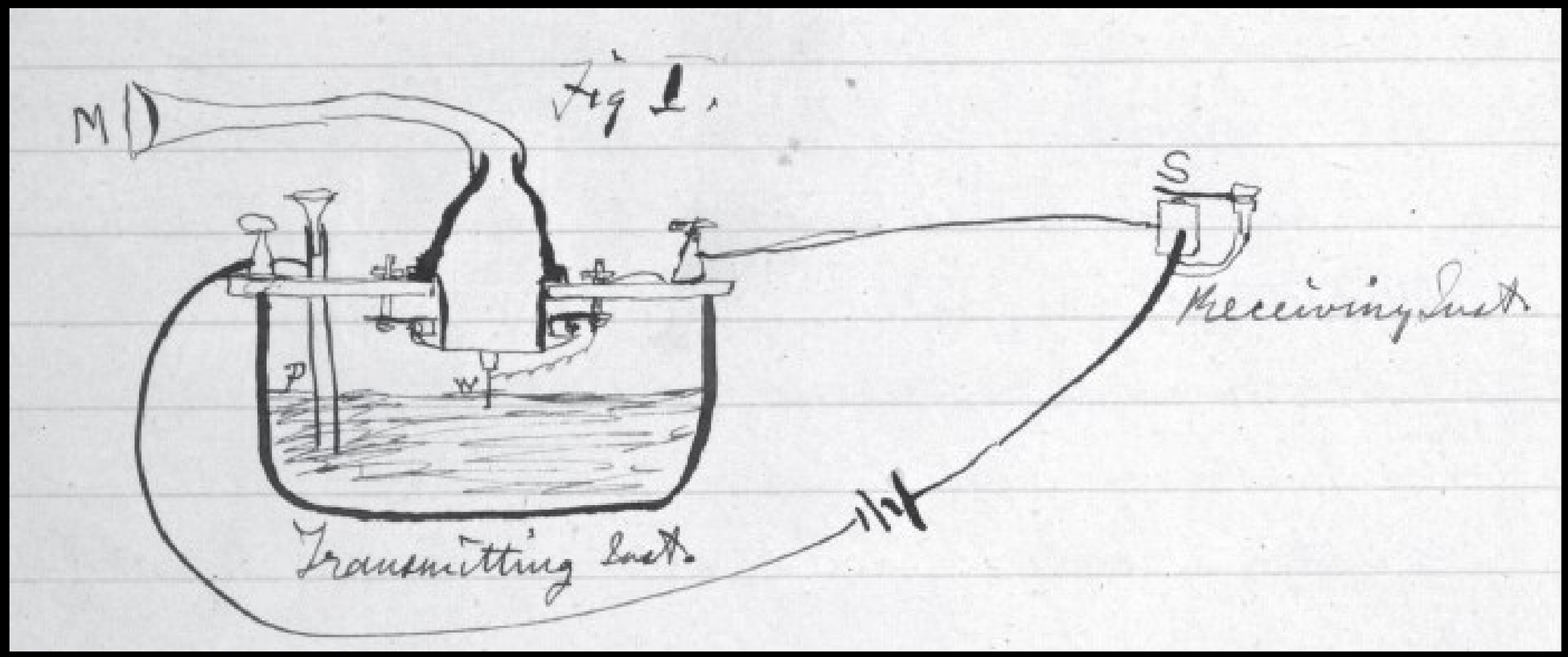
Mr. Watson was stationed in one room with the Receiving Instrument. He pressed one ear closely against S and closed his other ear with his hand. The Transmitting Instrument was placed in another room and the doors of both rooms were closed.

I then shouted into M the following sentence: "Mr. Watson – Come here – I want to see you". To my delight he came and declared that he had heard and understood what I said.

I asked him to repeat the words – He answered "You said 'Mr. Watson – come here – I want to see you'."

We then changed places and I listened at S while Mr. Watson read a few passages from a book into the mouth piece M. It was certainly the case that articulate sounds proceeded from S. The effect was loud but indistinct and muffled.

If I had read beforehand the passage given by Mr. Watson I should have recognized every word. As it was I could not make out the sense – but an occasional word here and there was quite distinct. I made out the "to" and "out" and "further", and finally the sentence "Mr. Bell do you understand what I say? DO-YOU-UNDER-STAND-WHAT-I-SAY" came quite clearly and intelligibly. No sound was audible when the armature S was removed.

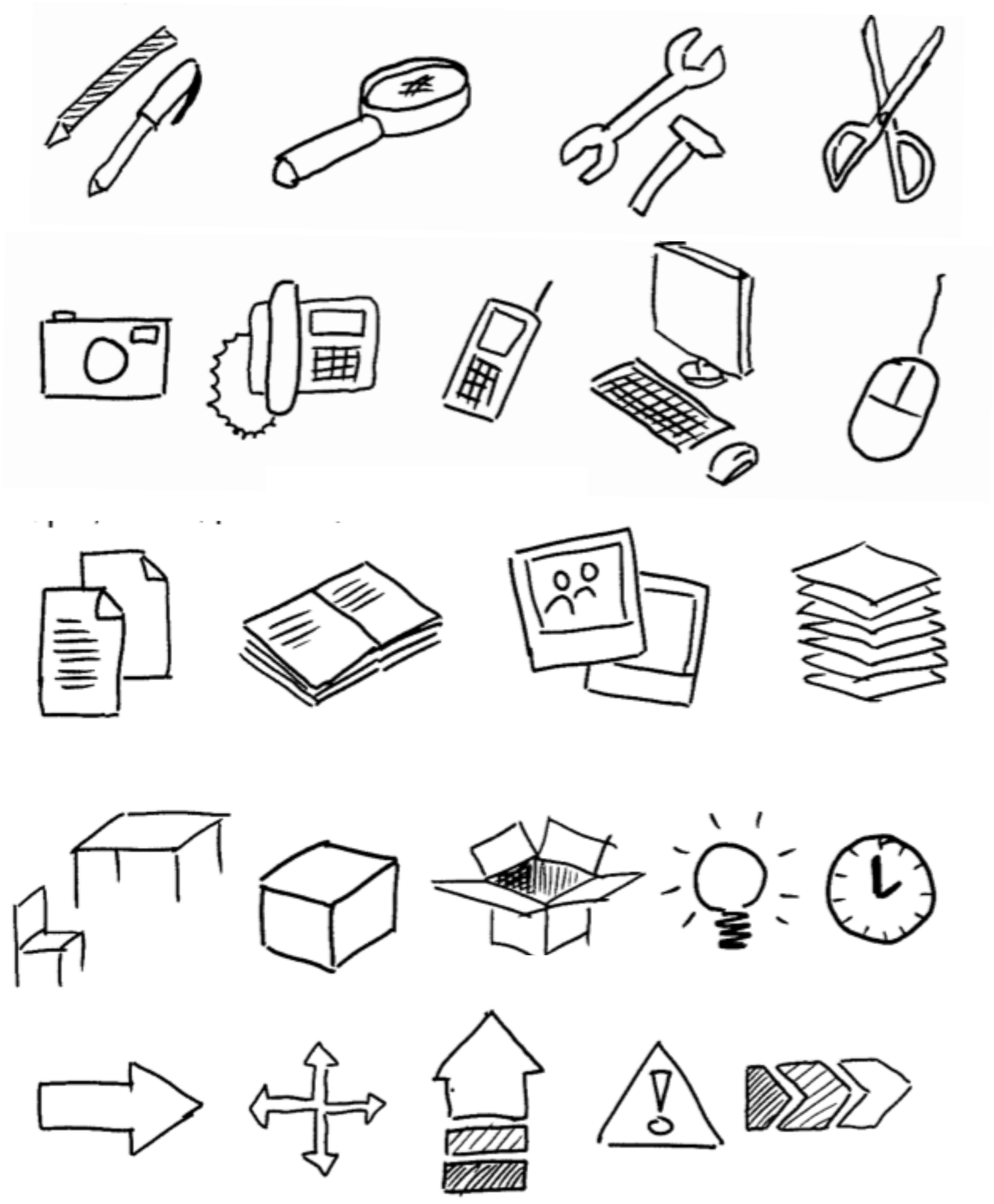


Clear vocabulary

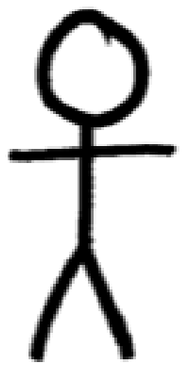
Getting Started: **Some Best Practices**

- 3D is not necessary (most of the time)
- Add date, time (+context)
- Try sketching with fast, long strokes
- Keep your mistakes
- Analog before digital

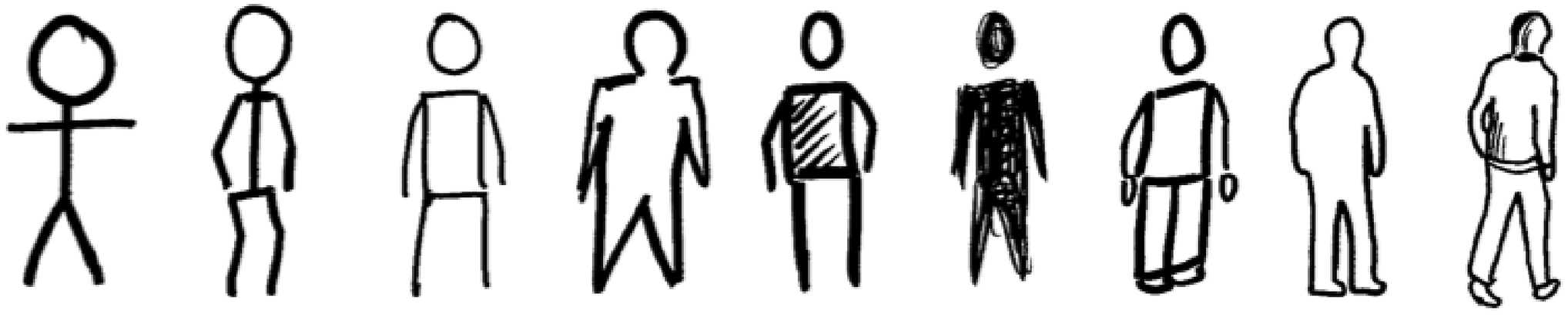
Getting Started: **Sketching Vocabulary**



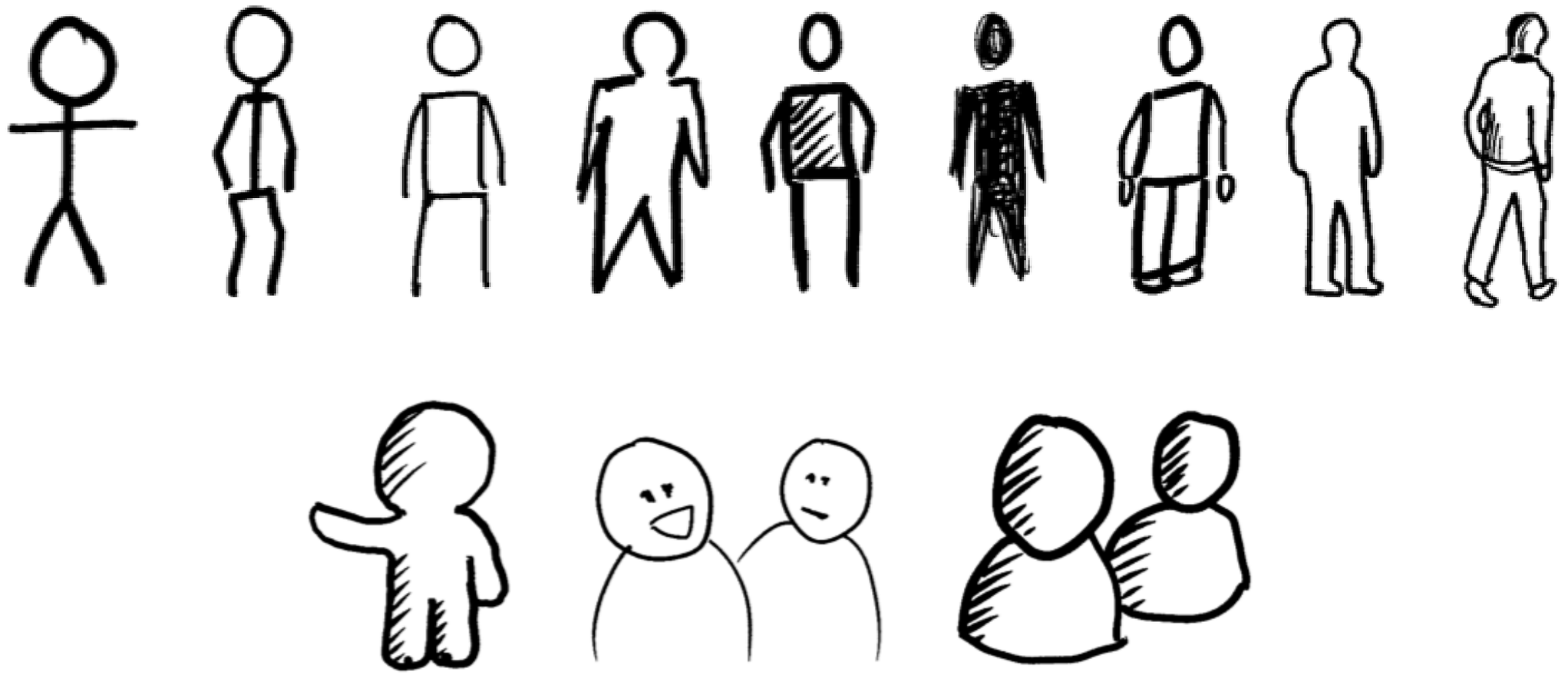
Greenberg et al. [2]



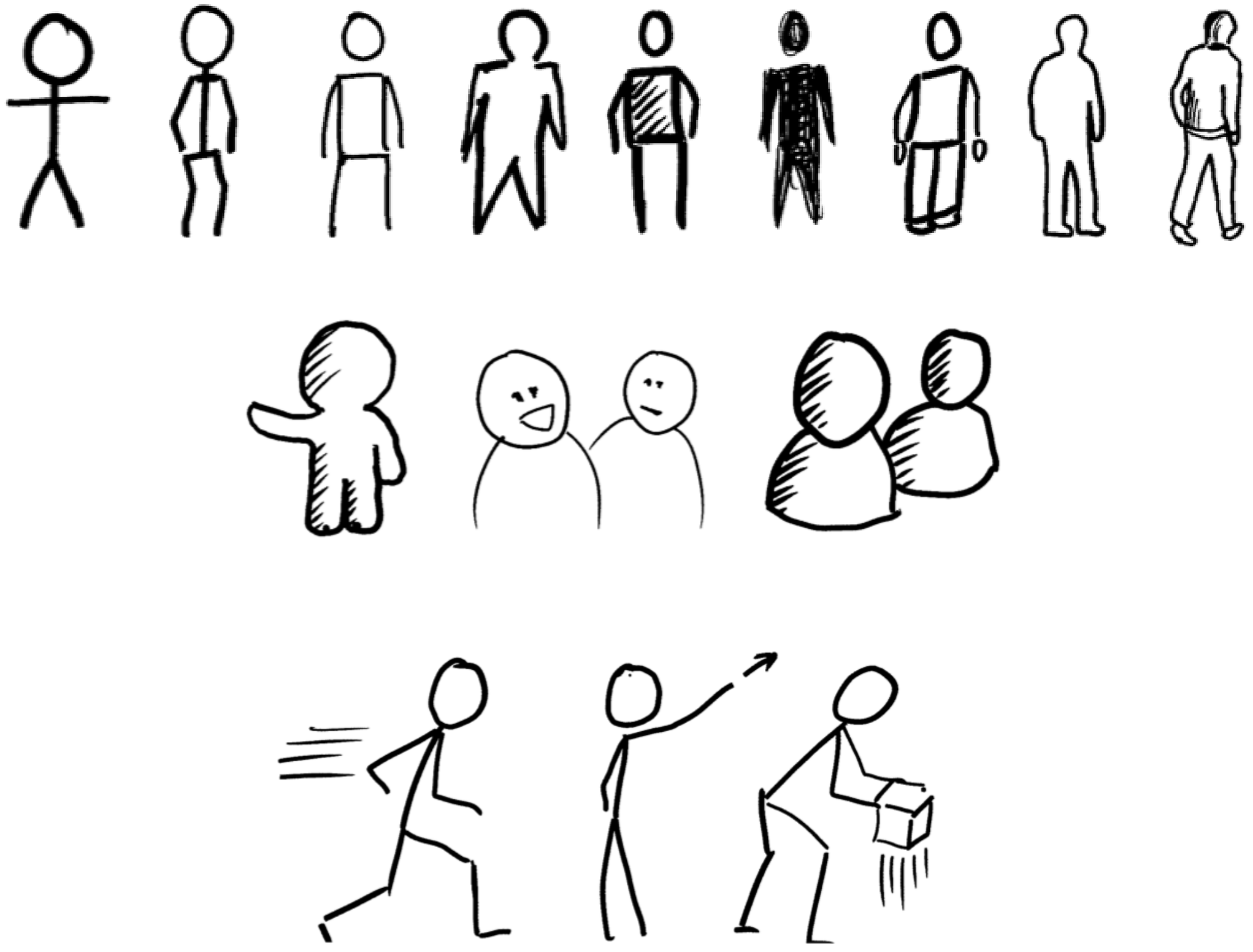
Greenberg et al. [2]



Greenberg et al. [2]



Greenberg et al. [2]

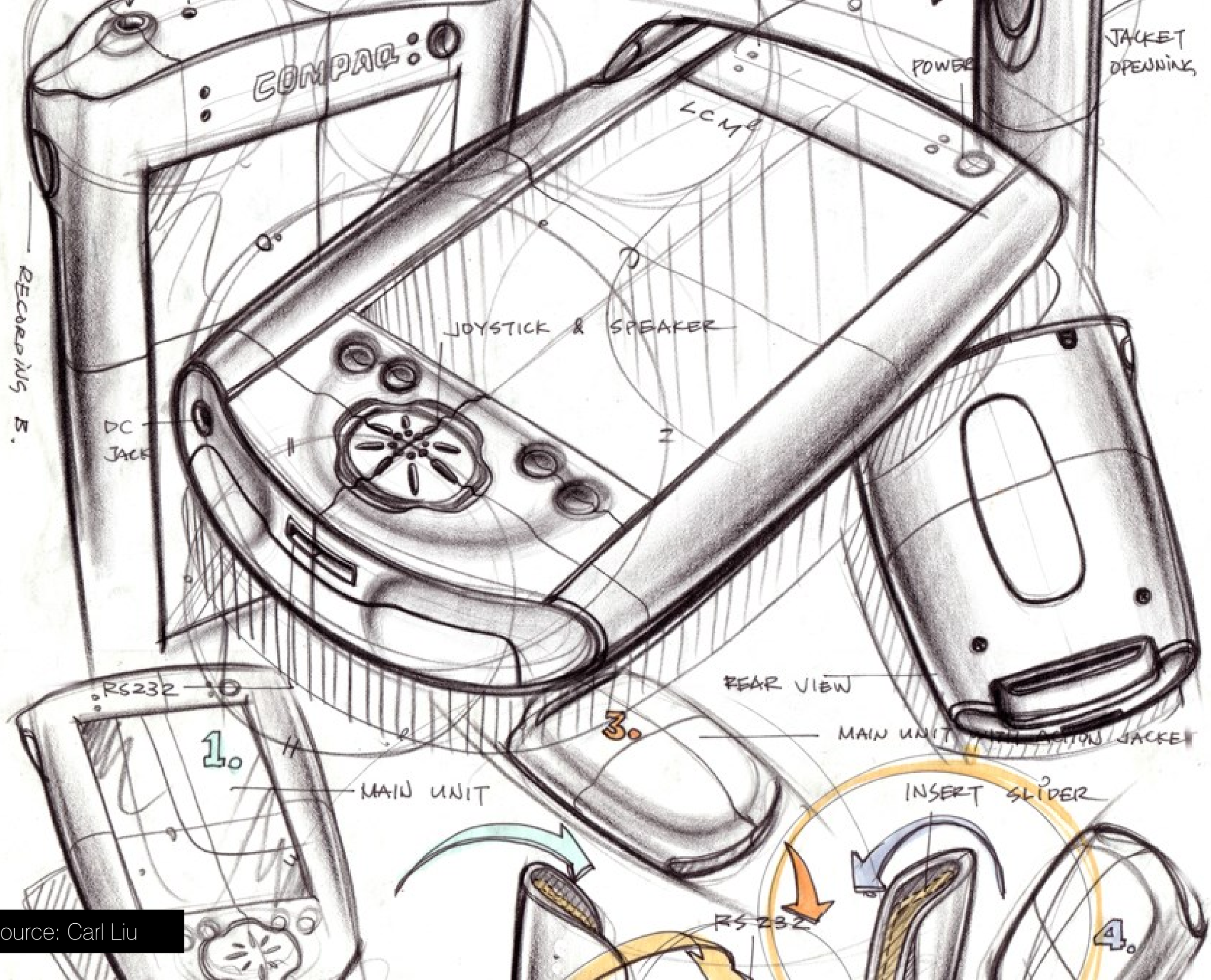


Greenberg et al. [2]

Live sketching:

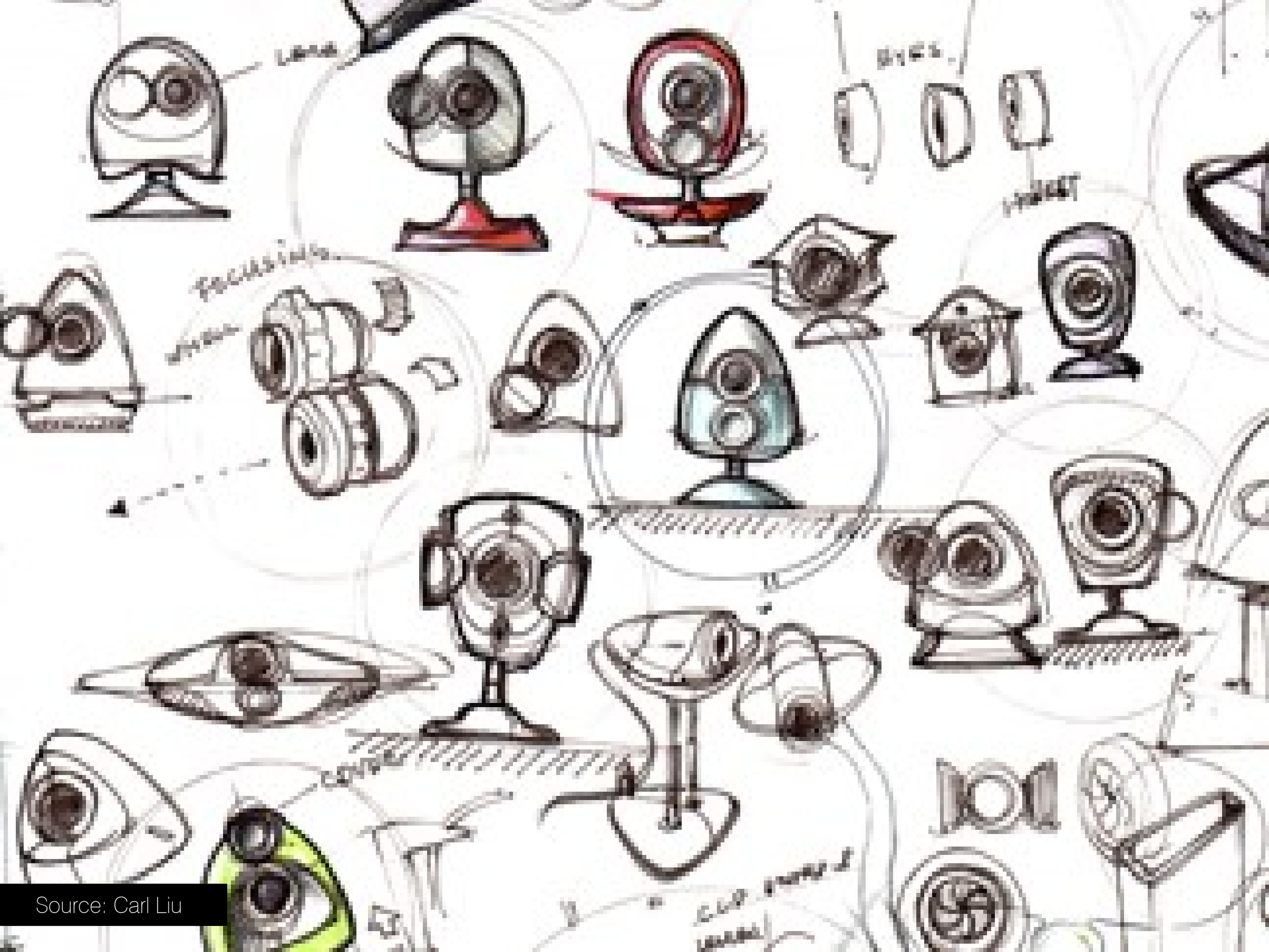
sketching vocabulary & basic techniques

Carl Liu | Product Designer



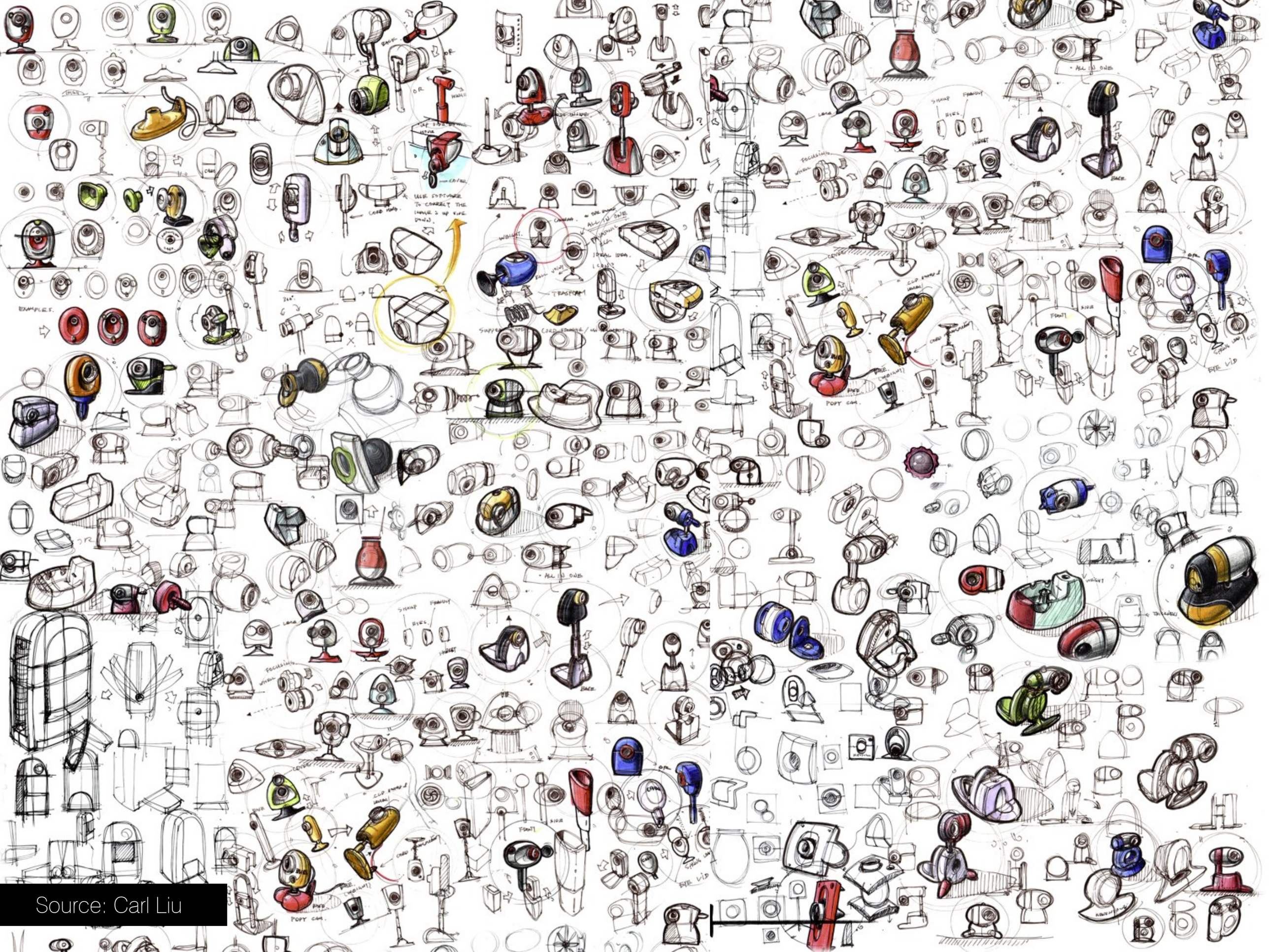
Source: Carl Liu

Source: Carl Liu



Source: Carl Liu

Source: Carl Liu



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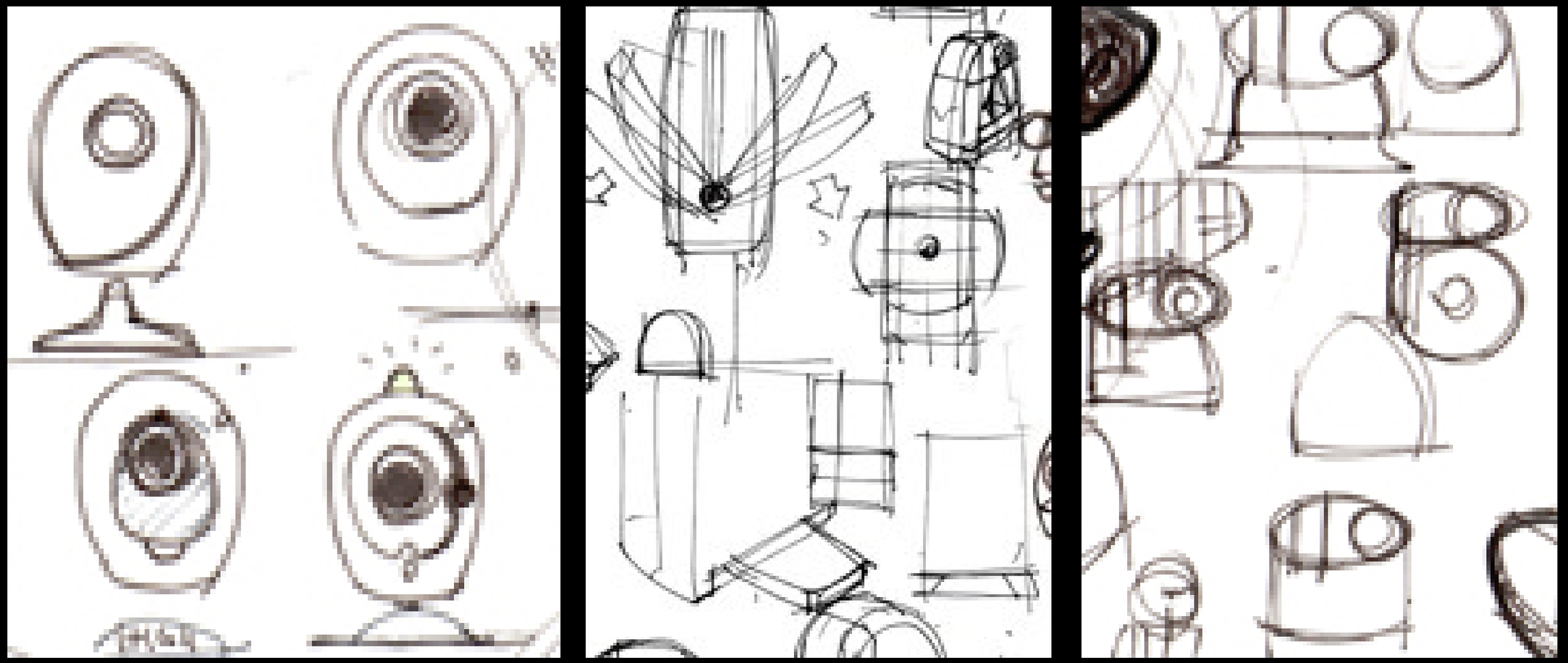

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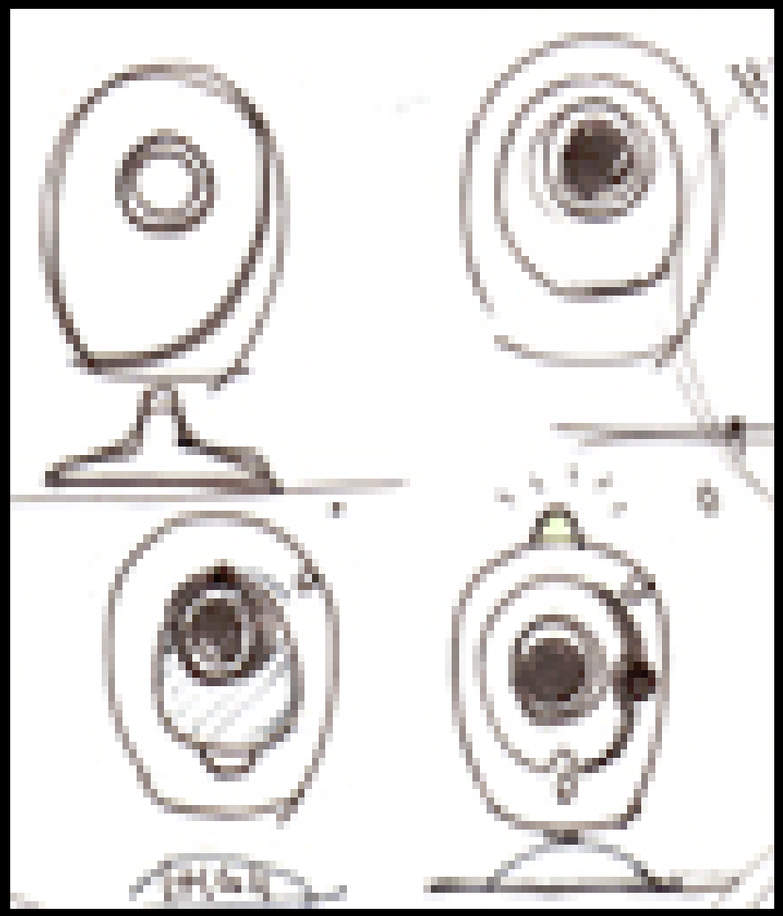
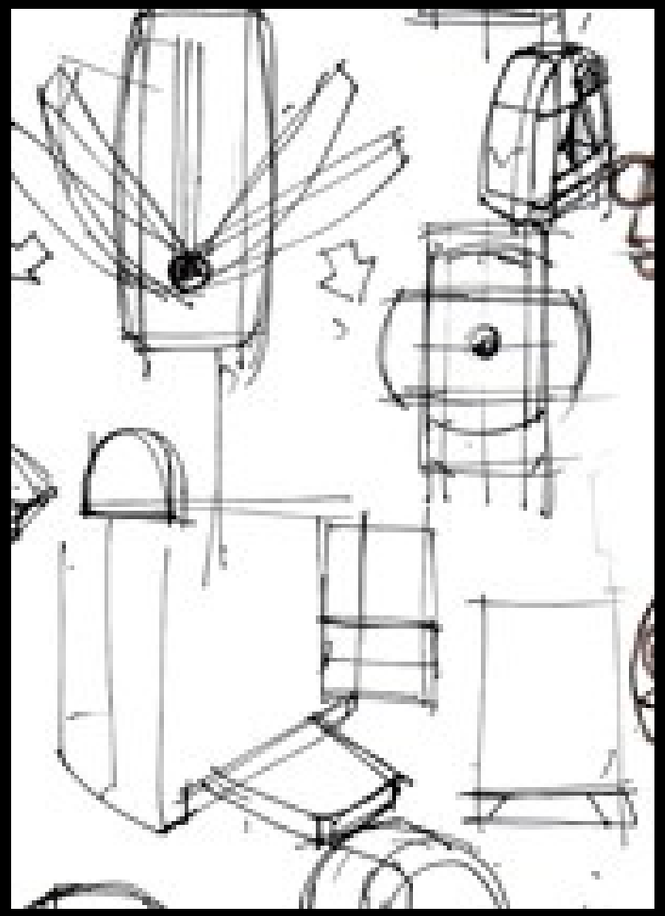
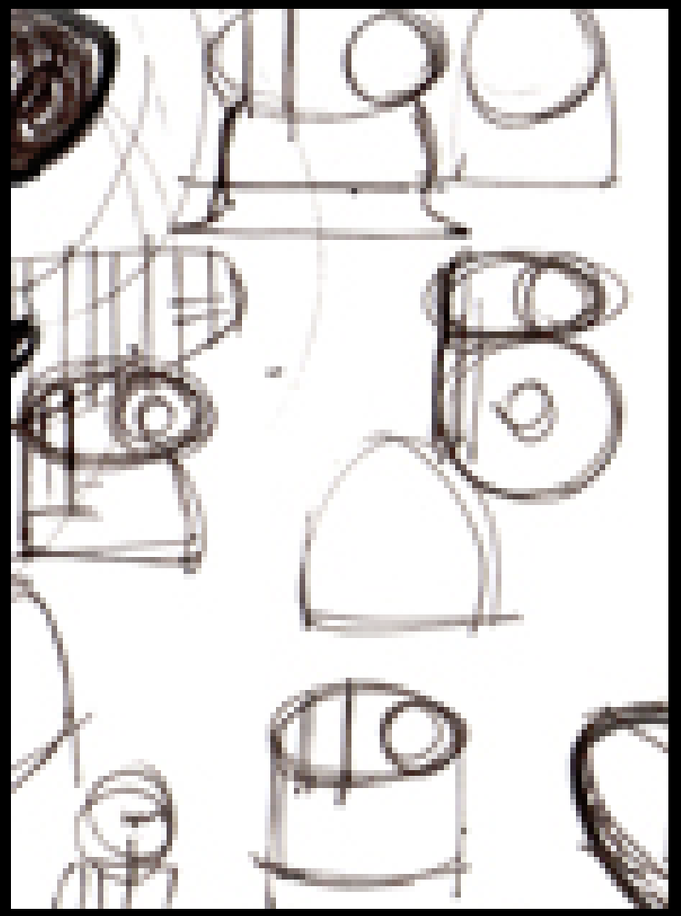
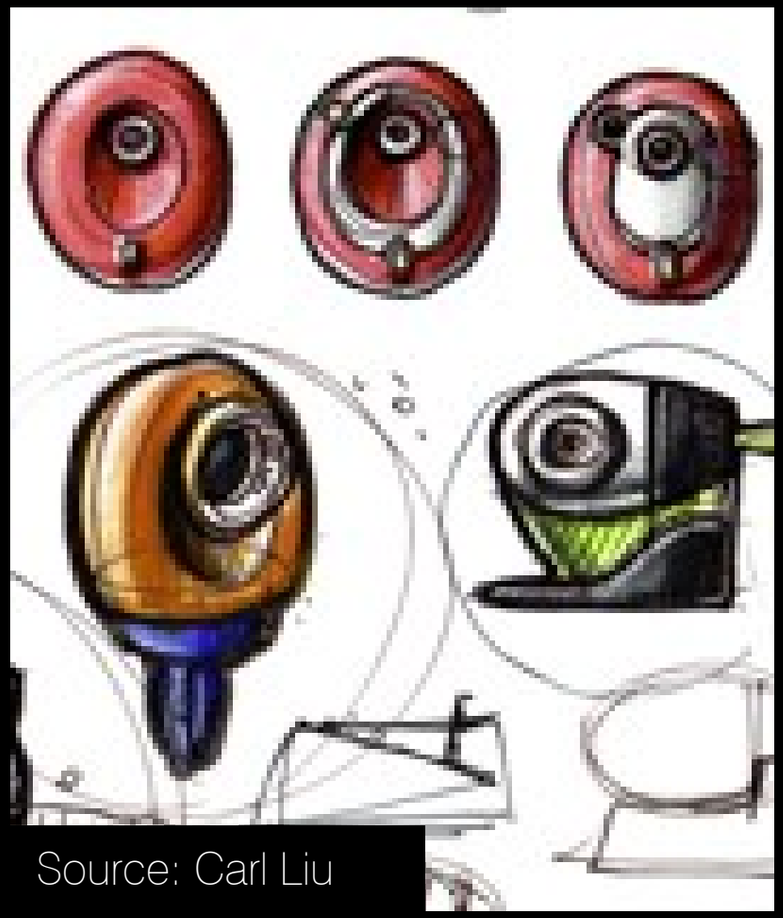


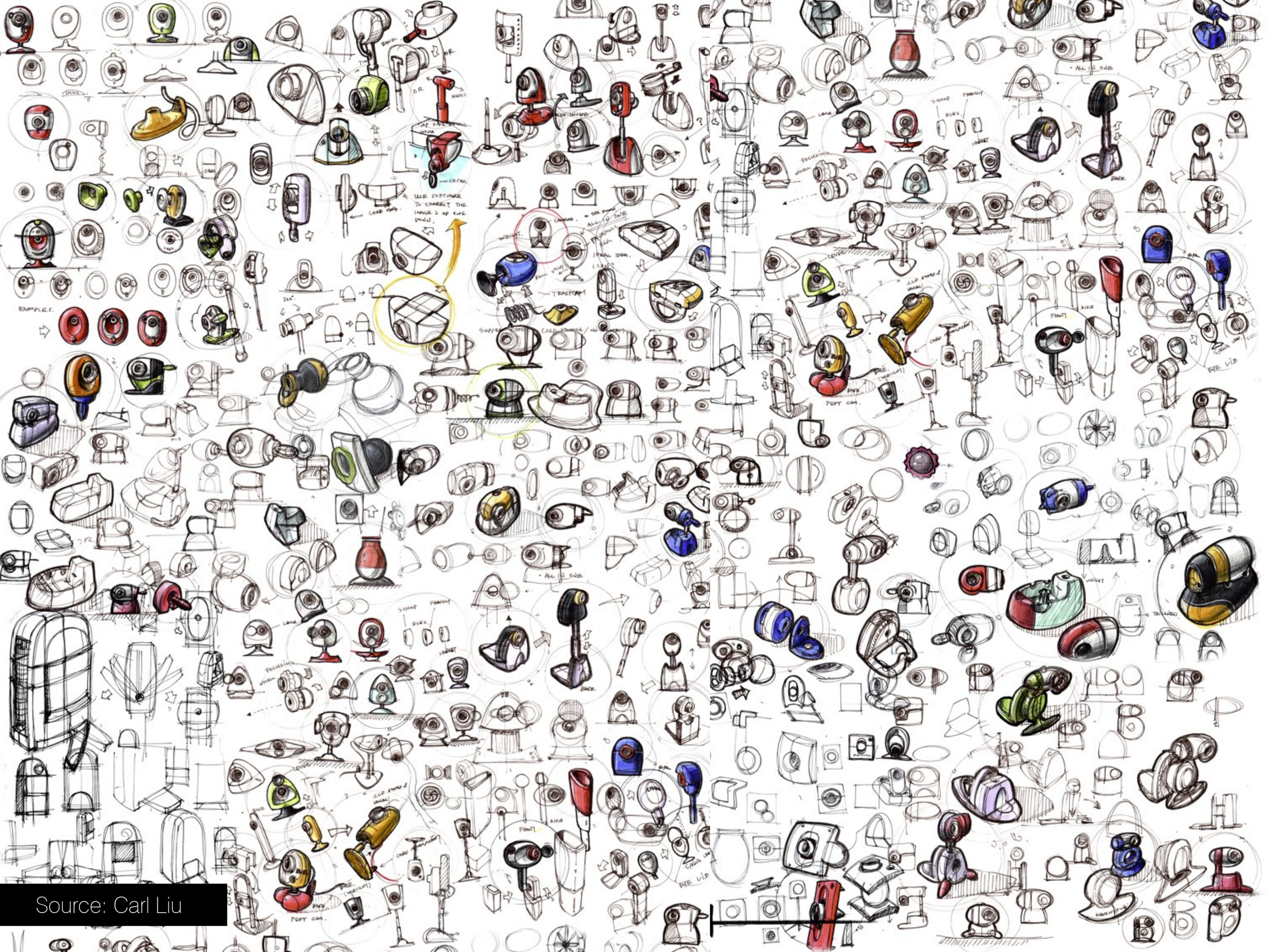






Source: Carl Liu

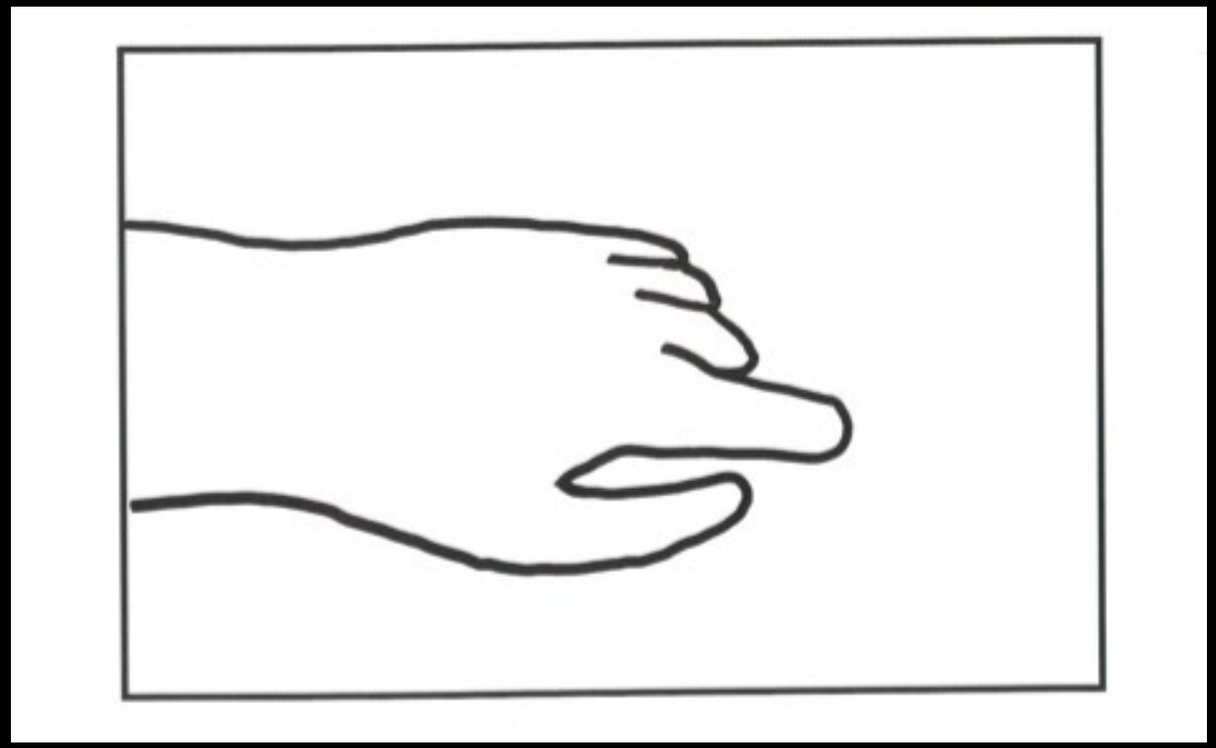
Plentiful



Source: Carl Liu

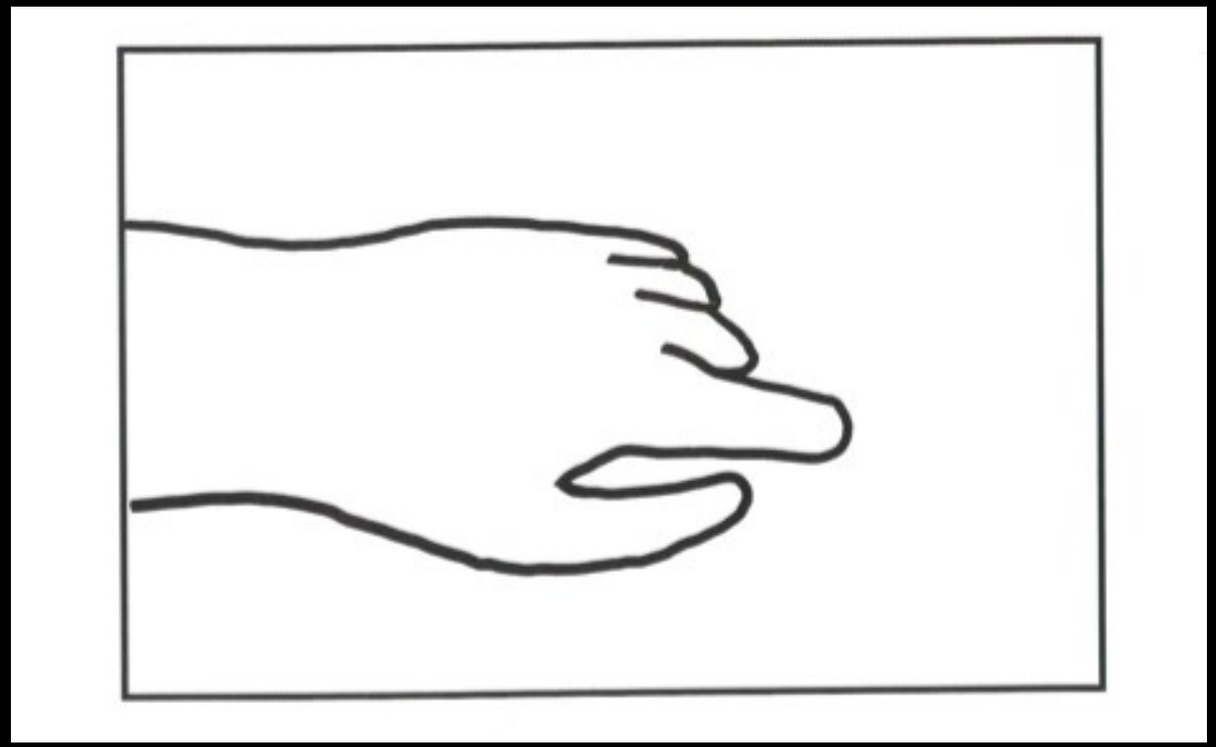
Sketching Shortcuts: **Photo Tracing**

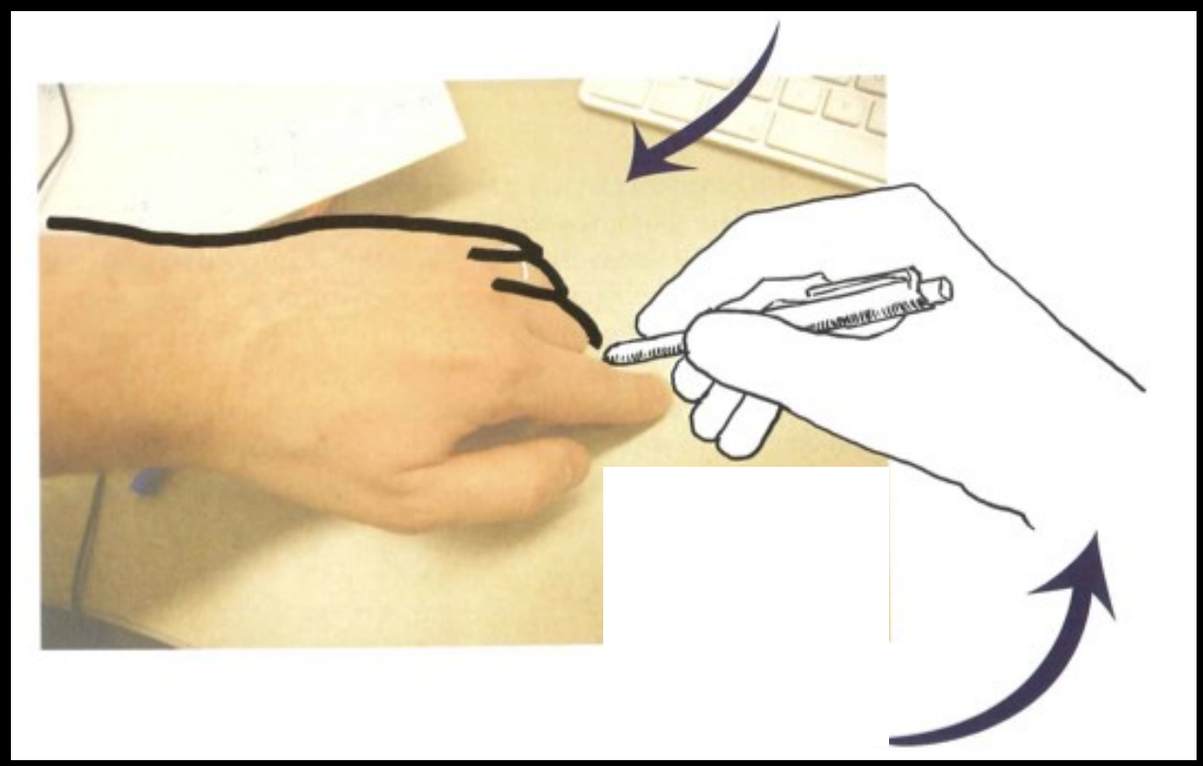
Sketching Shortcuts: **Photo Tracing**



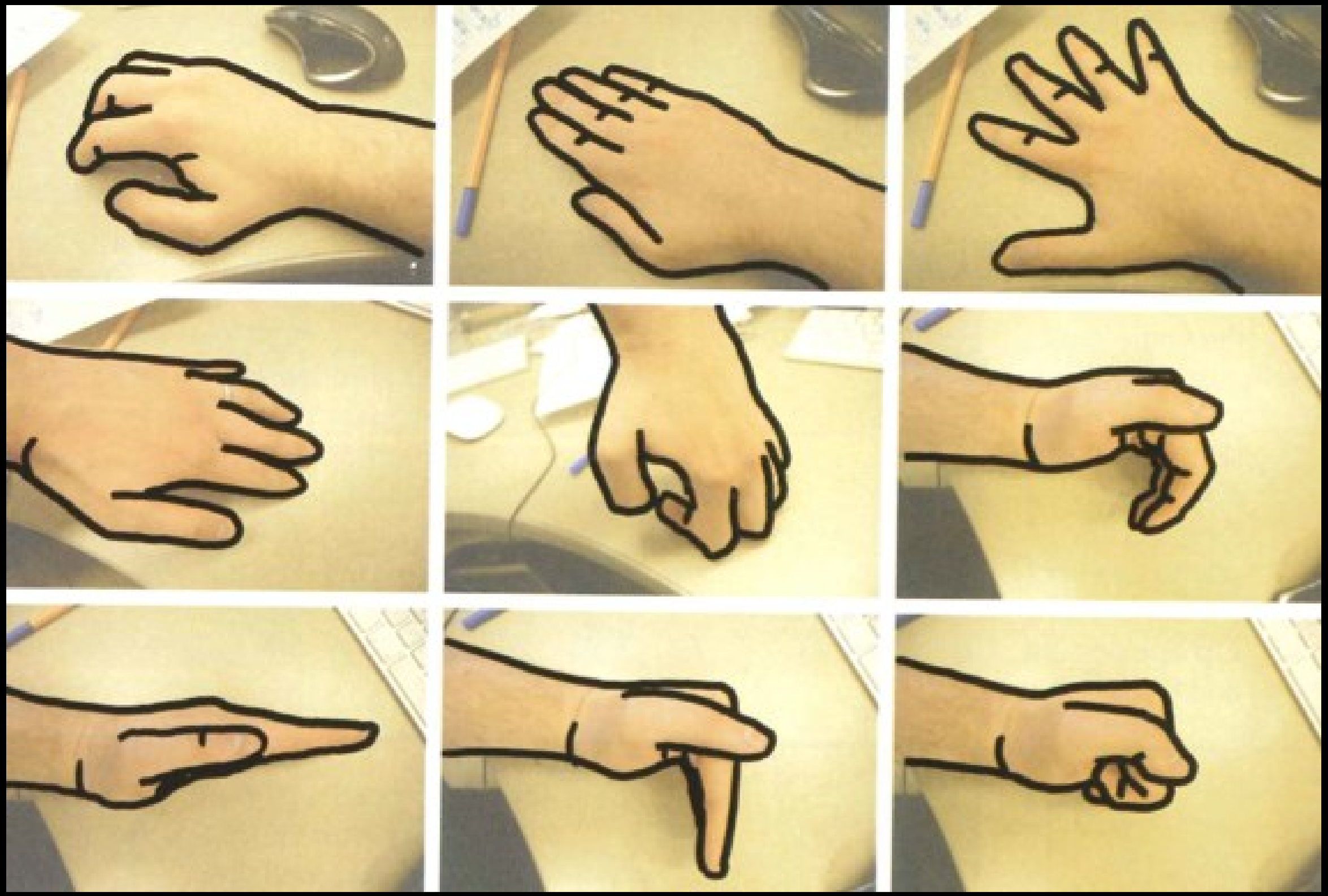
Greenberg et al. [2]

Sketching Shortcuts: **Photo Tracing**

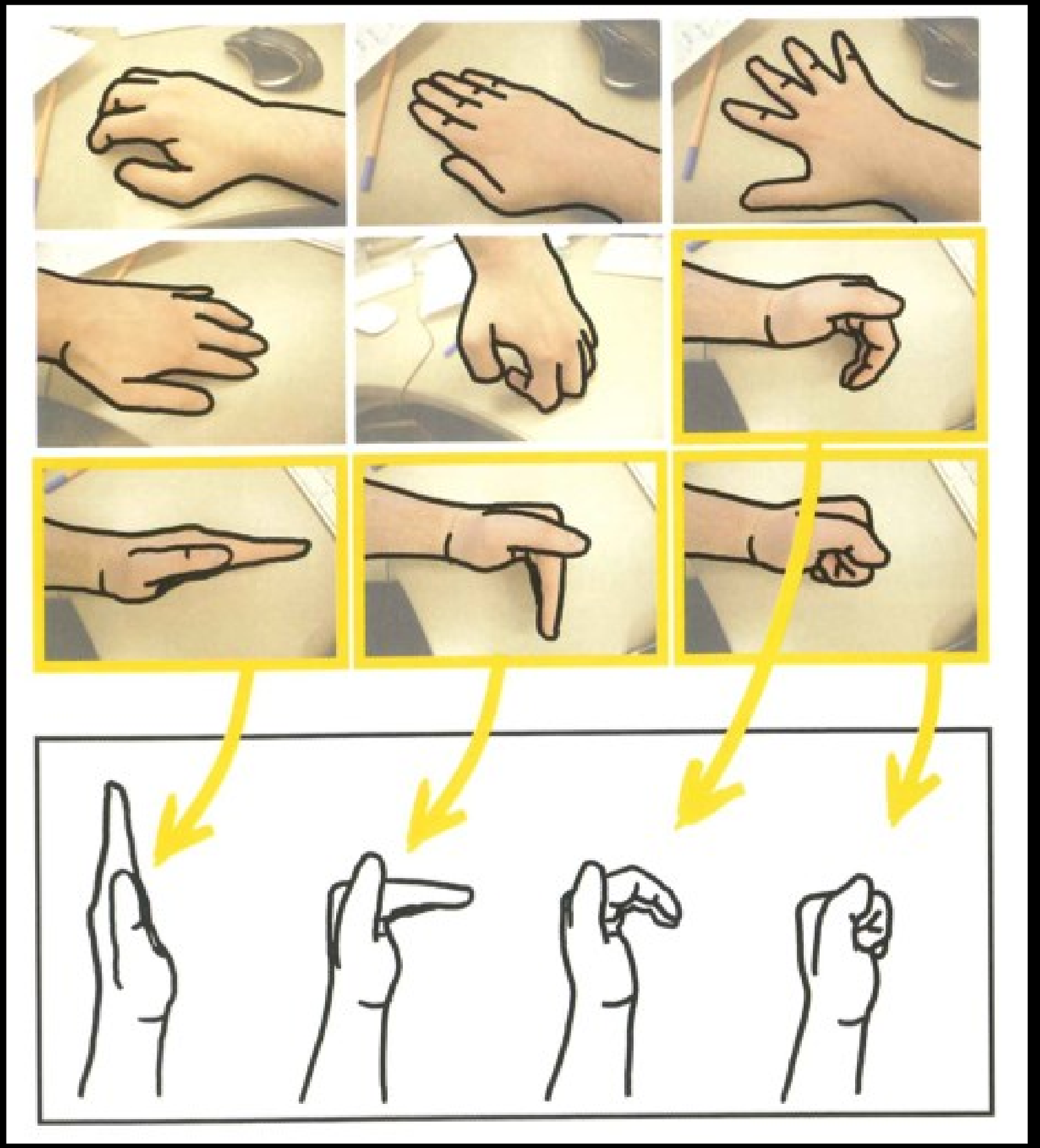




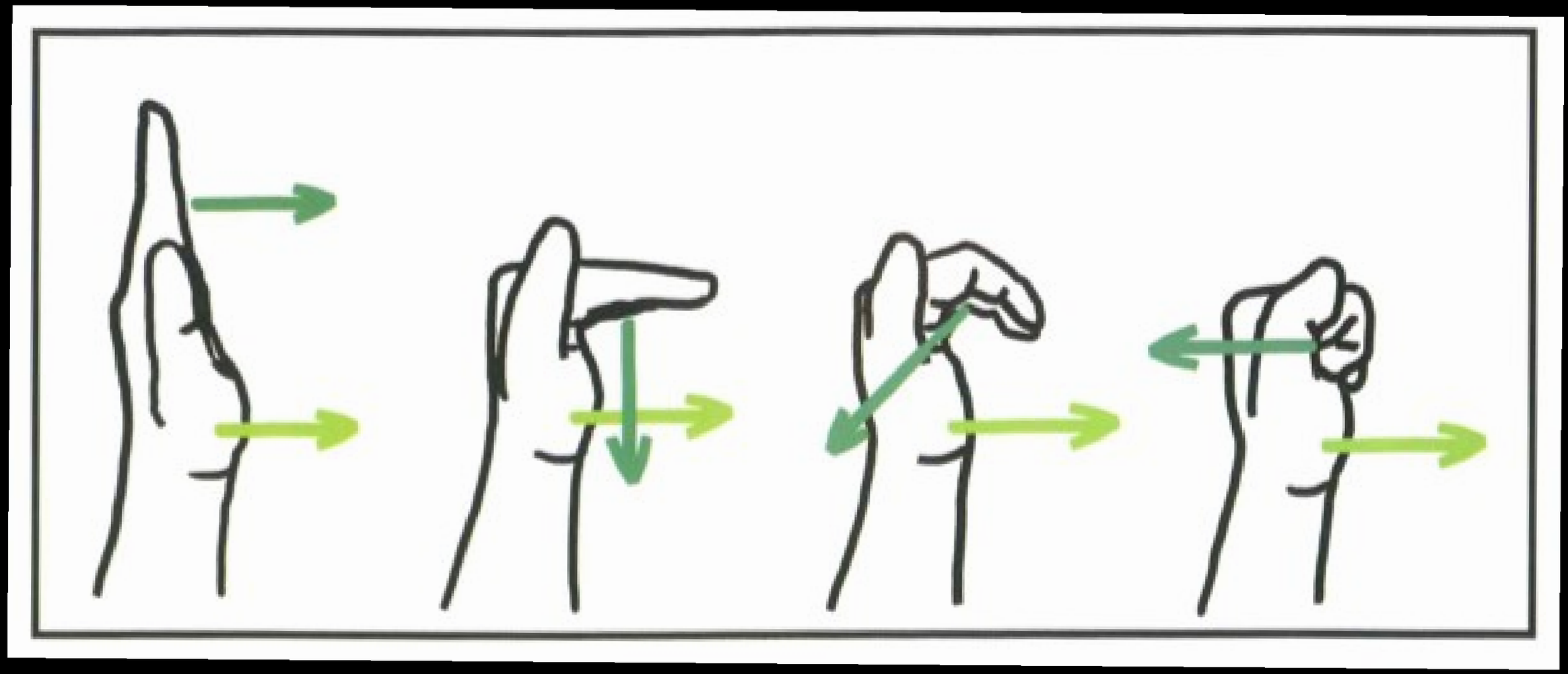
Greenberg et al. [2]



Greenberg et al. [2]



Greenberg et al. [2]

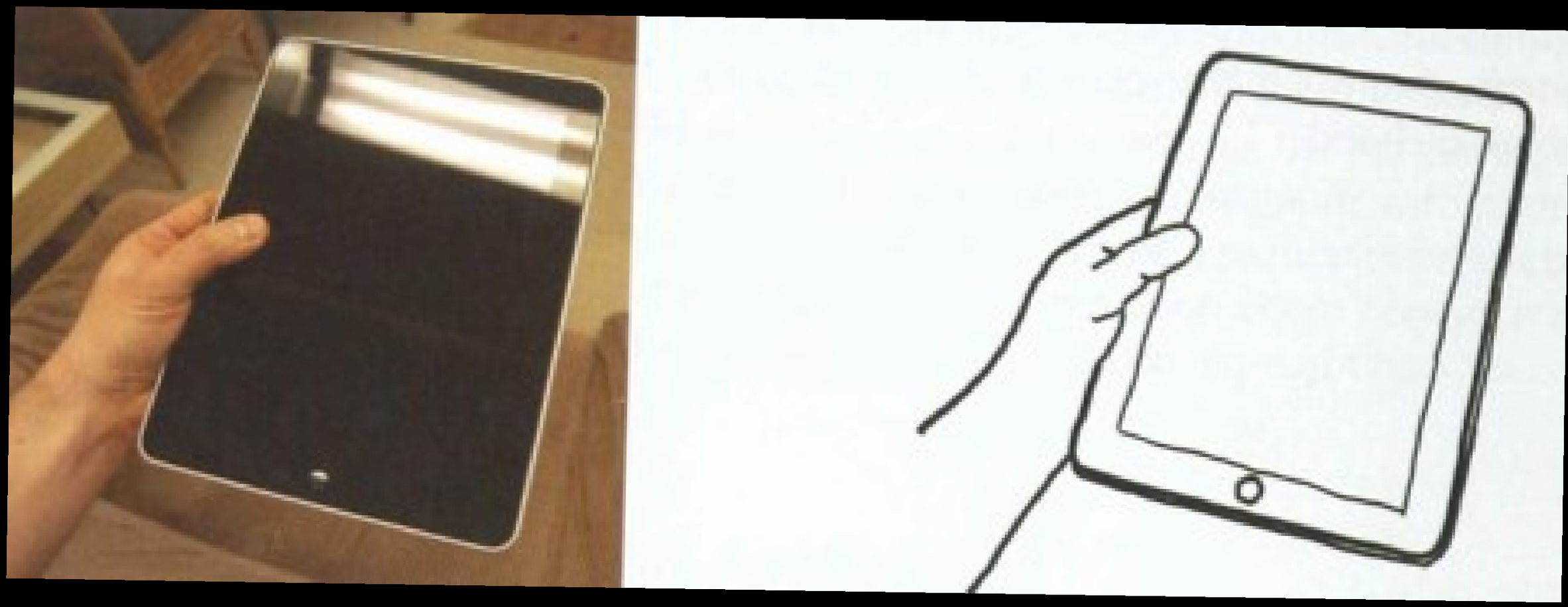


Greenberg et al. [2]

Sketching Shortcuts: **Templates**

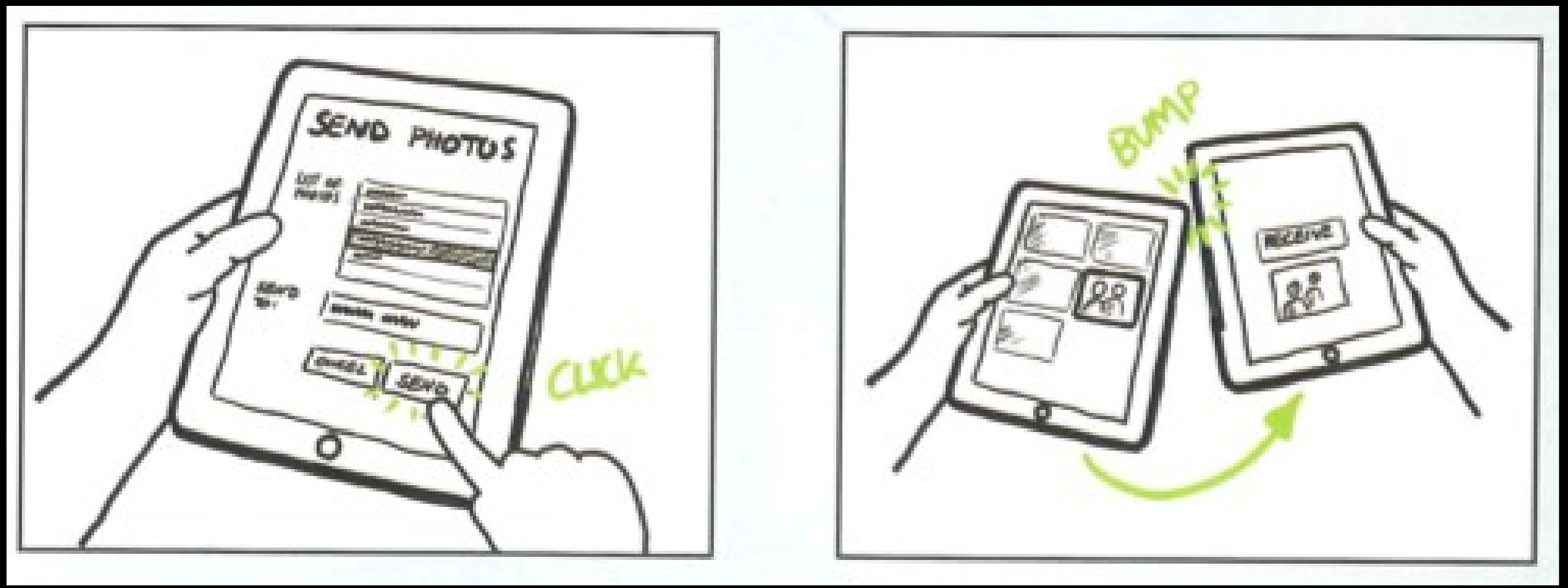
Greenberg et al. [2]

Sketching Shortcuts: **Templates**



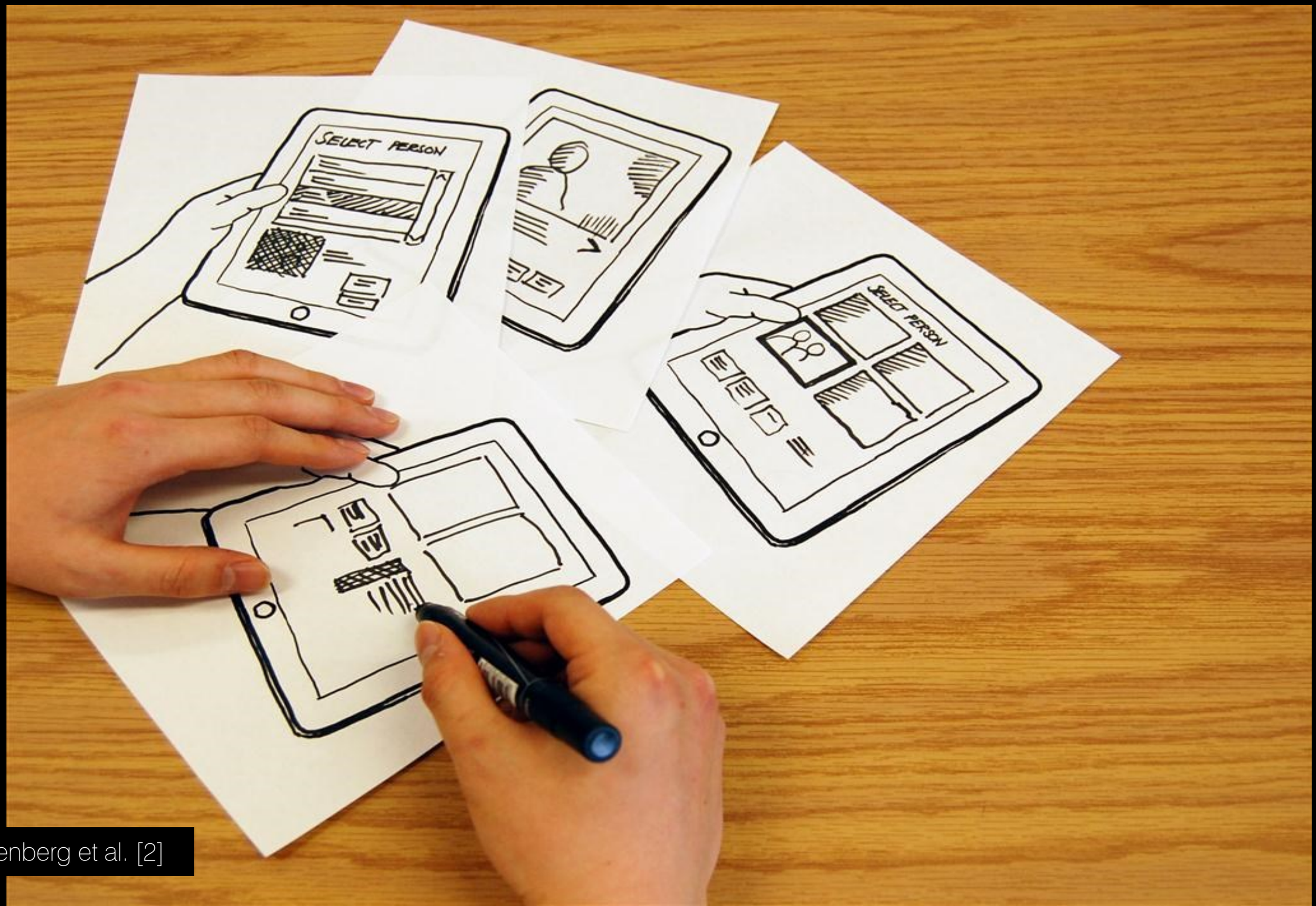
Greenberg et al. [2]

Sketching Shortcuts: **Templates**



Greenberg et al. [2]

Sketching Shortcuts: **Templates**



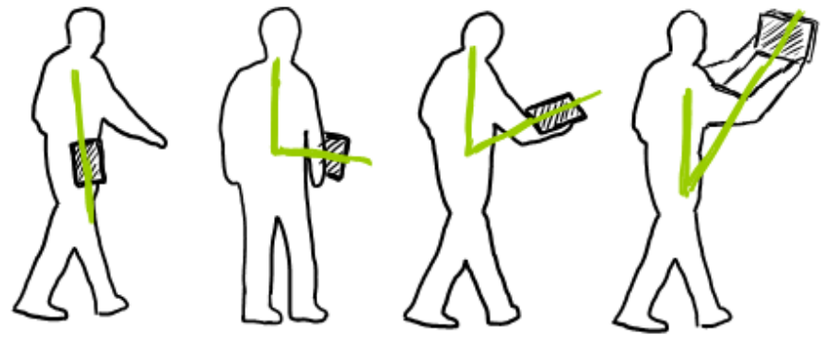
Greenberg et al. [2]

Live sketching:

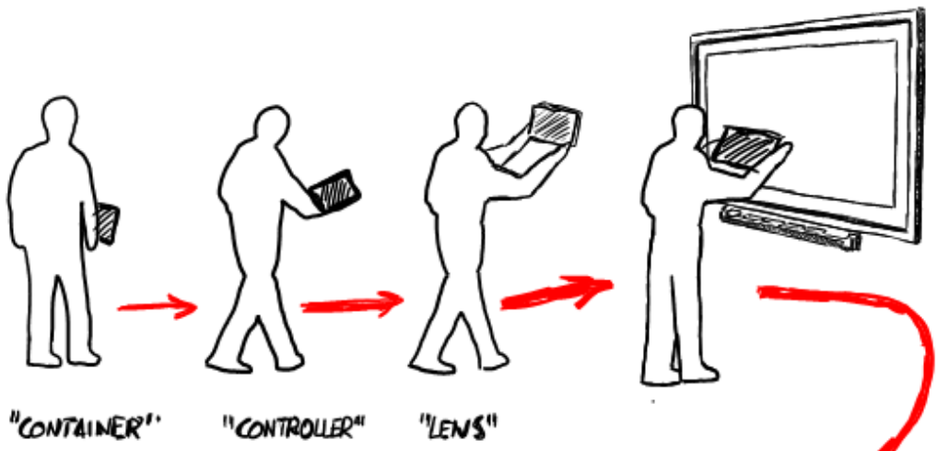
tracing & templates

1 DEVICE-TO-PERSON

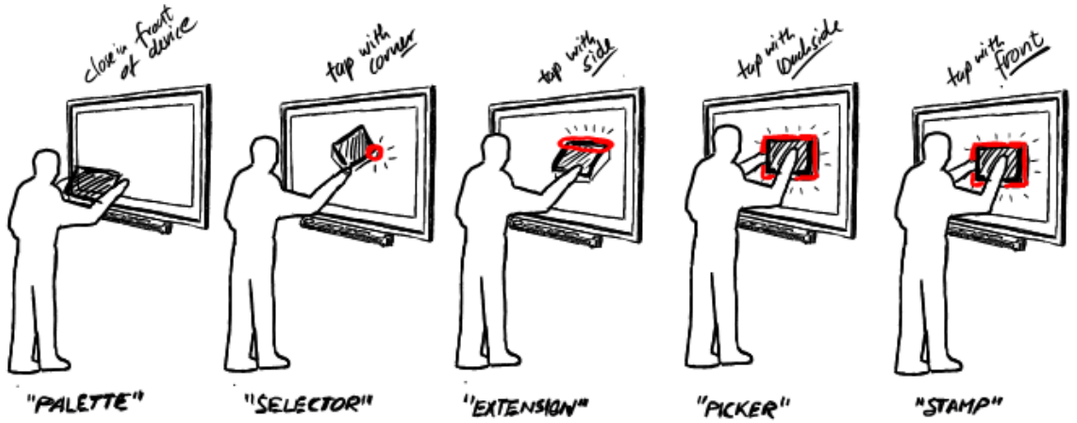
— relative orientation
\+
distance to person



2 DEVICE-TO-DEVICE

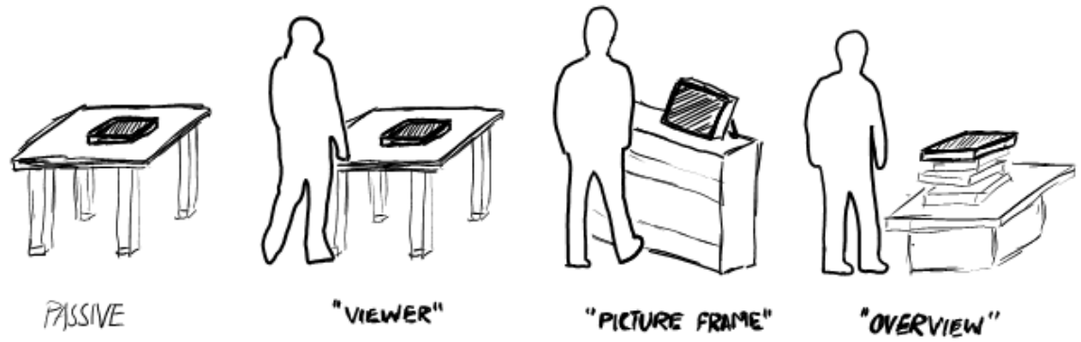


DISTANCE TO DEVICE

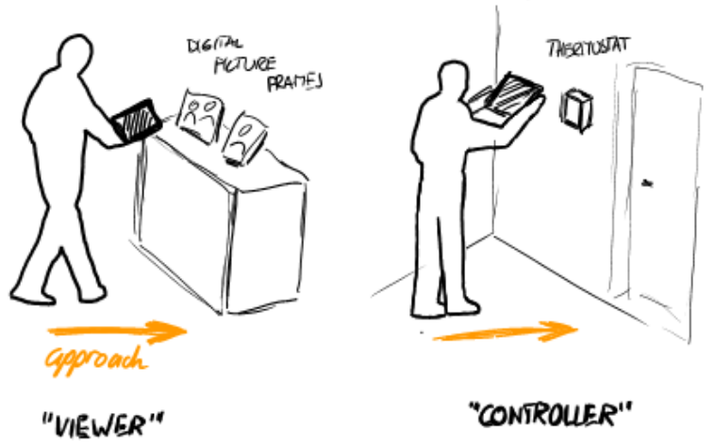


CONTACT AREA / POINT + POSITION / ANGLE

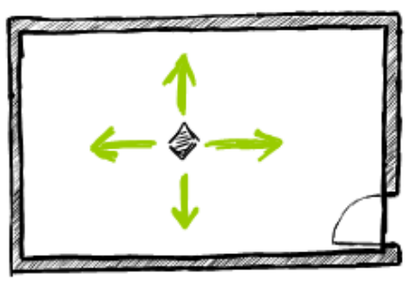
3 DEVICE-TO-NON DIGITAL OBJECTS / FIXED AND SEMIFIXED FEATURE SPACE



4 DEVICE-TO-INFORMATION APPLIANCES
(subset of device-to-device?)



5 DEVICE-TO-FIXED FEATURE/ ENVIRONMENT



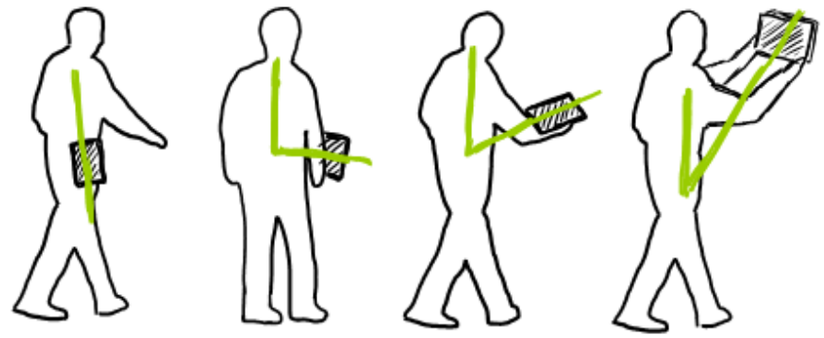
- location & orientation relative to room
- identity of room?

6 DEVICE PROPERTIES

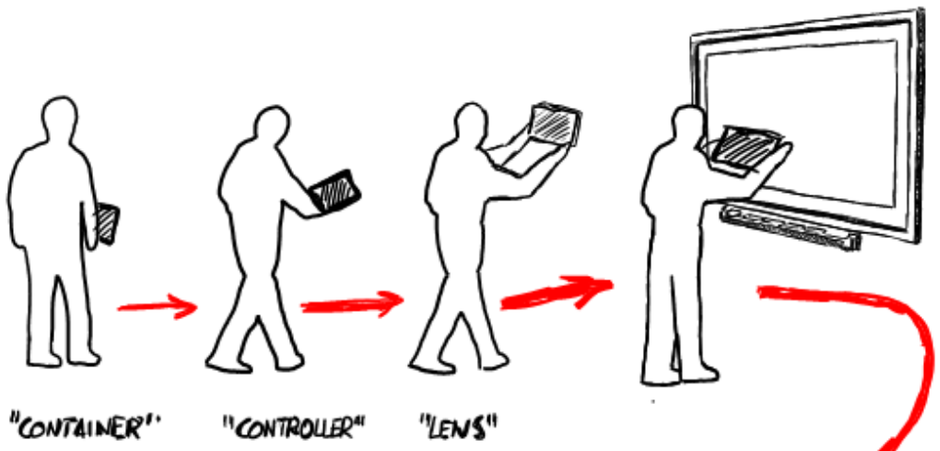
- visible
- activity
- owner
- people around
- global orientation (gyro + age → compass)

1 DEVICE-TO-PERSON

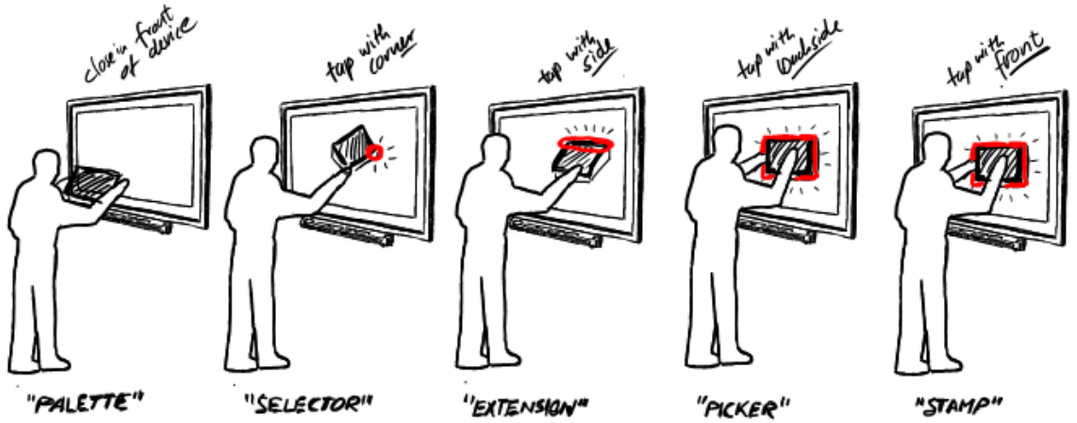
— relative orientation
\+
distance to person



2 DEVICE-TO-DEVICE

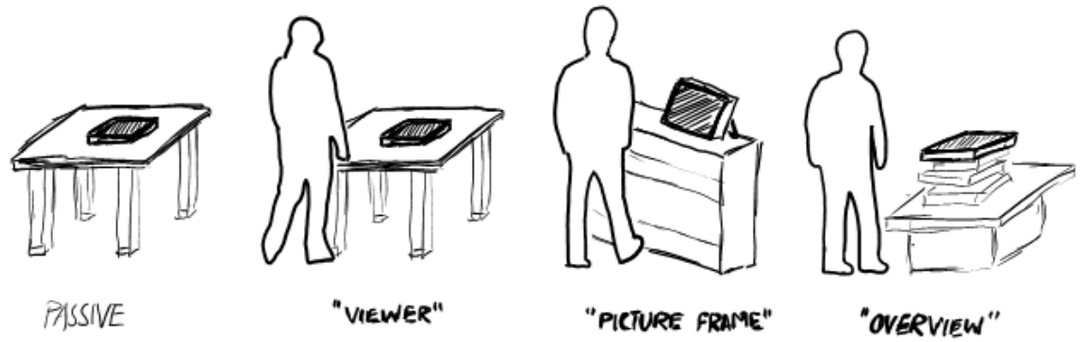


DISTANCE TO DEVICE

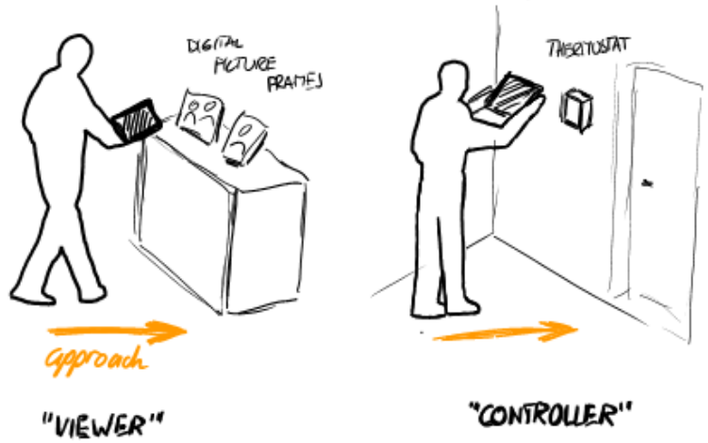


CONTACT AREA / POINT + POSITION / ANGLE

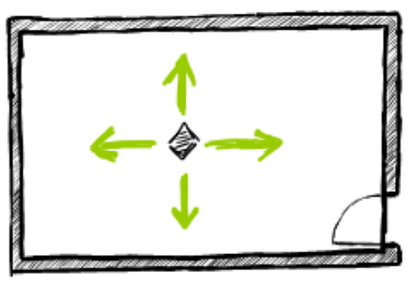
3 DEVICE-TO-NON DIGITAL OBJECTS / FIXED AND SEMIFIXED FEATURE SPACE



4 DEVICE-TO-INFORMATION APPLIANCES
(subset of device-to-device?)



5 DEVICE-TO-FIXED FEATURE/ ENVIRONMENT



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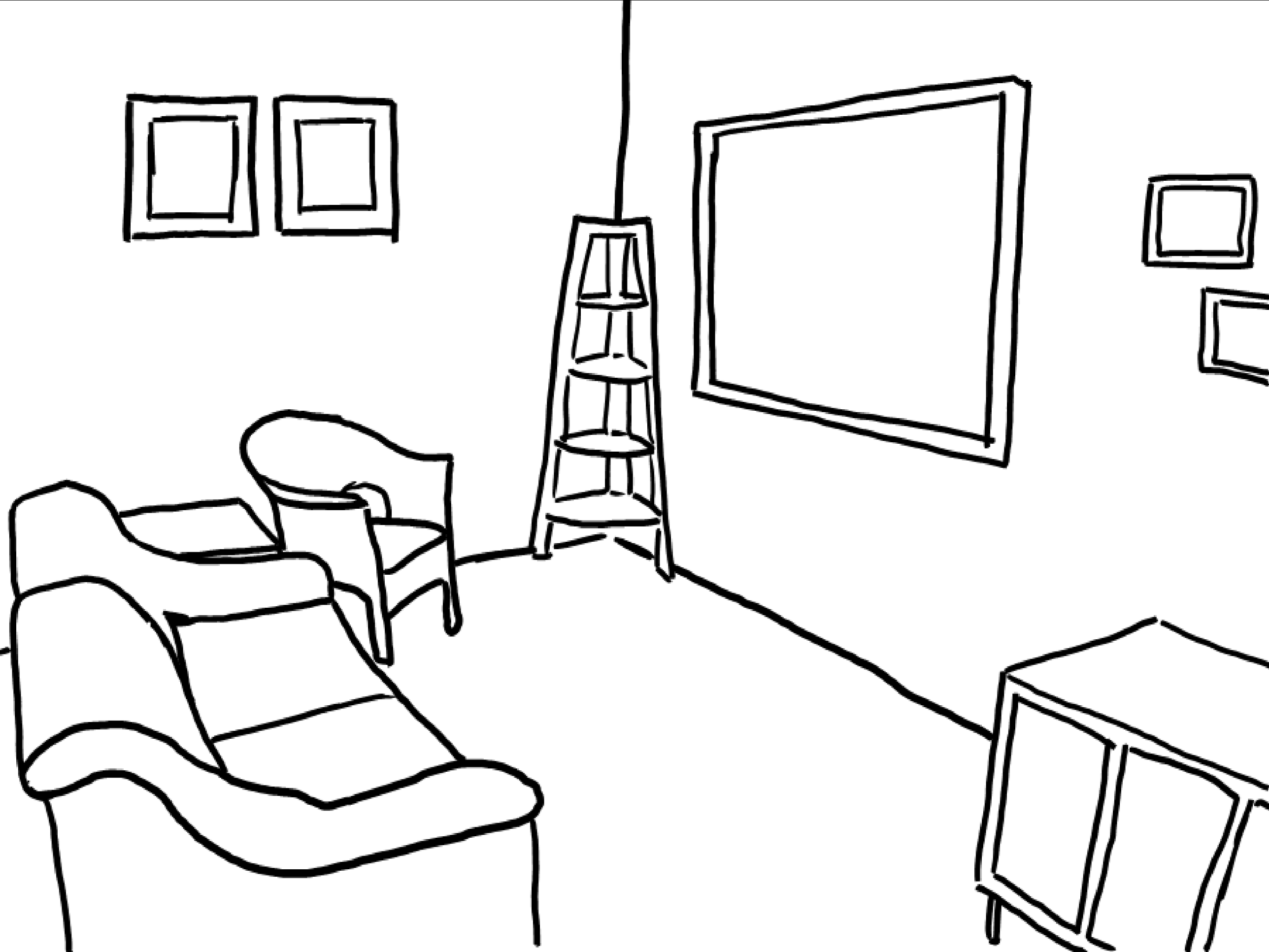
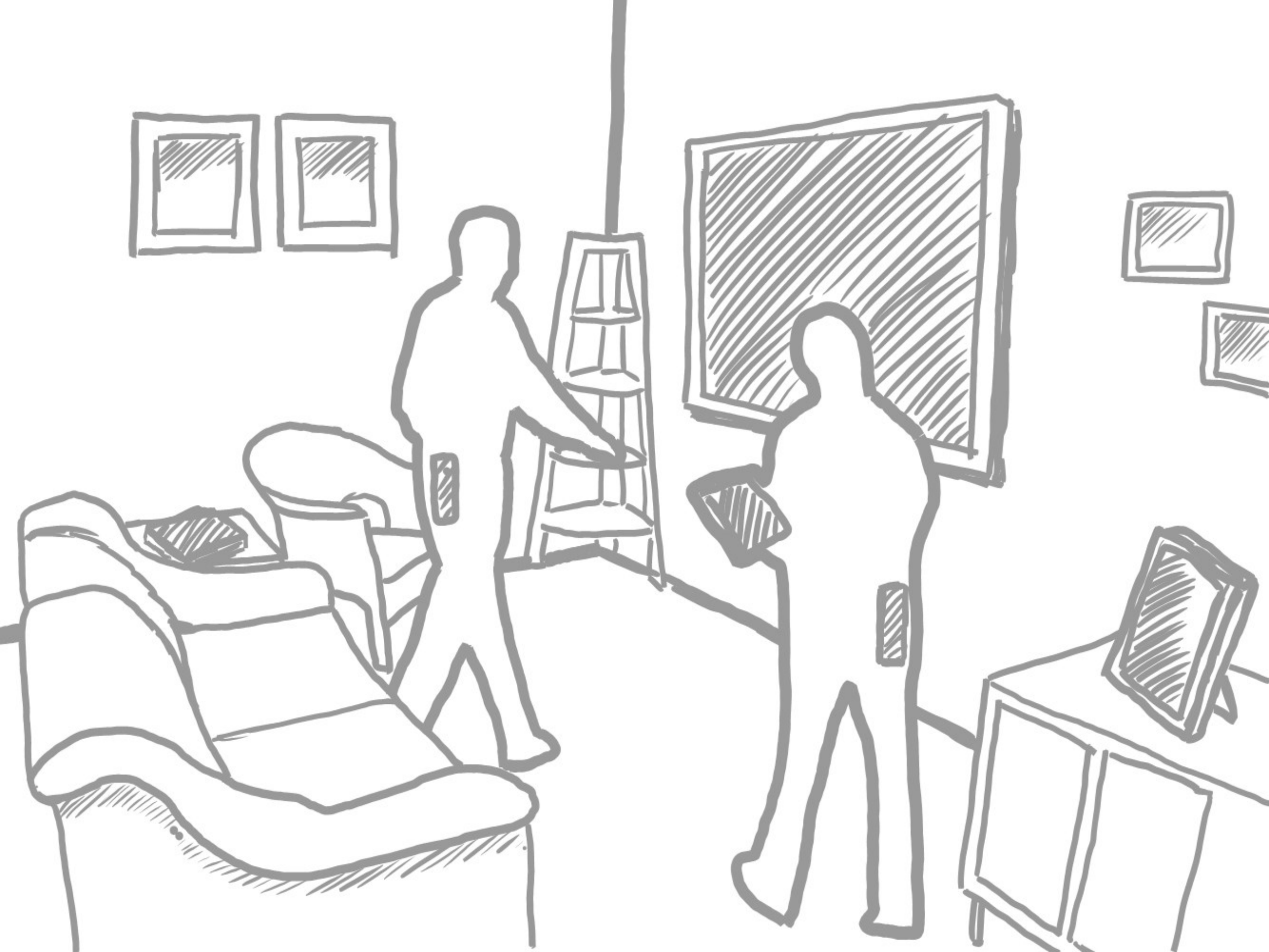
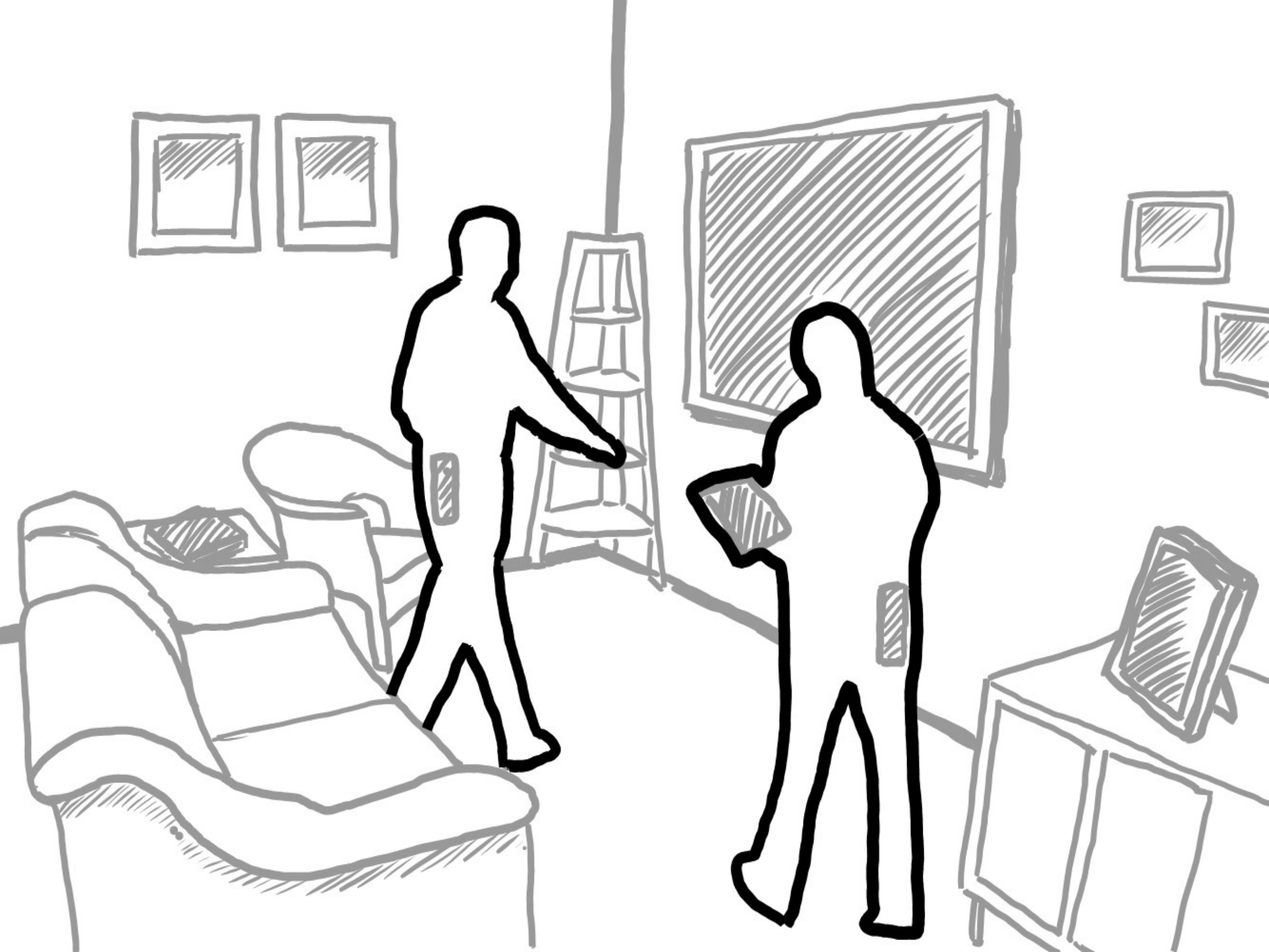
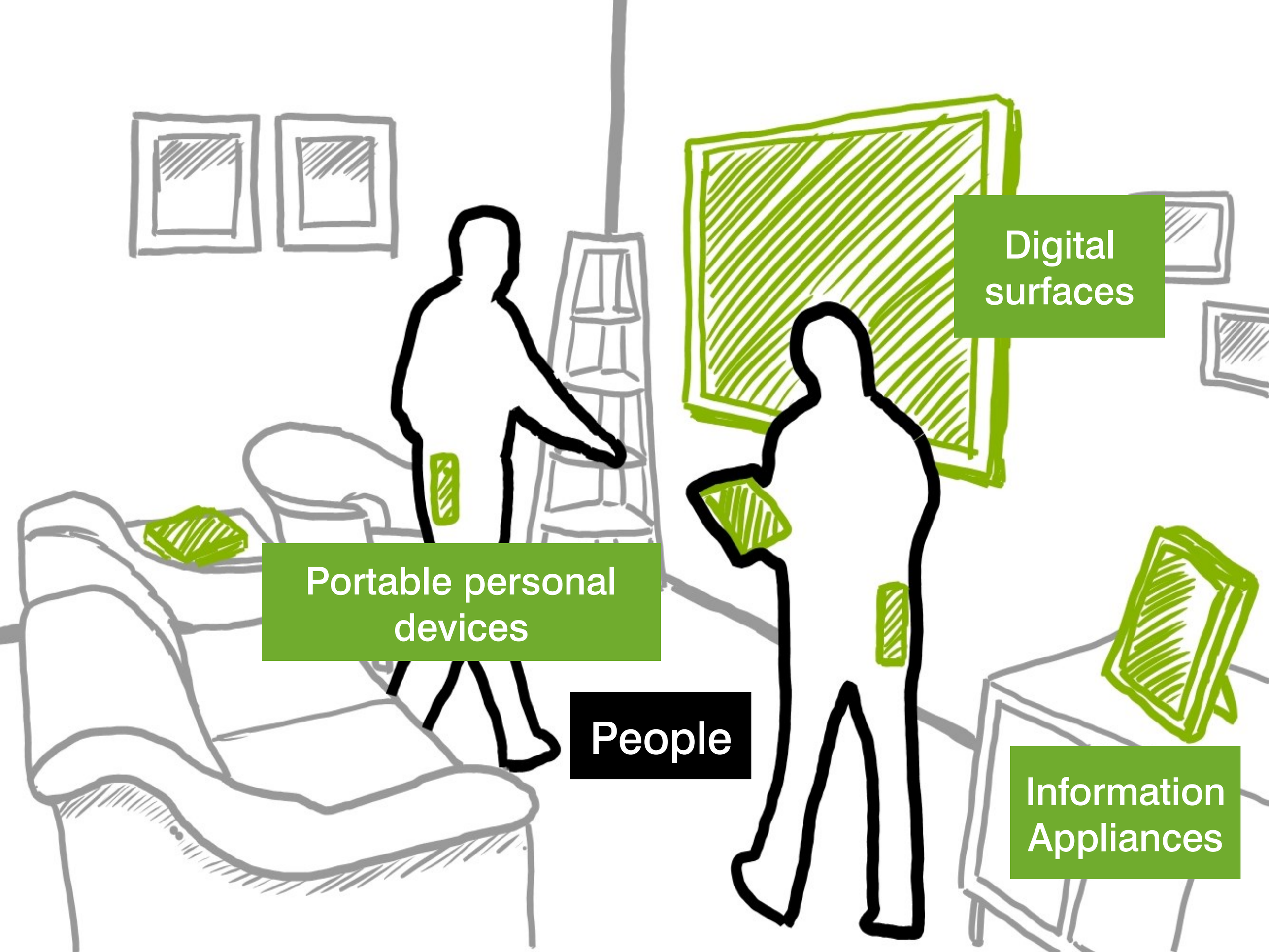
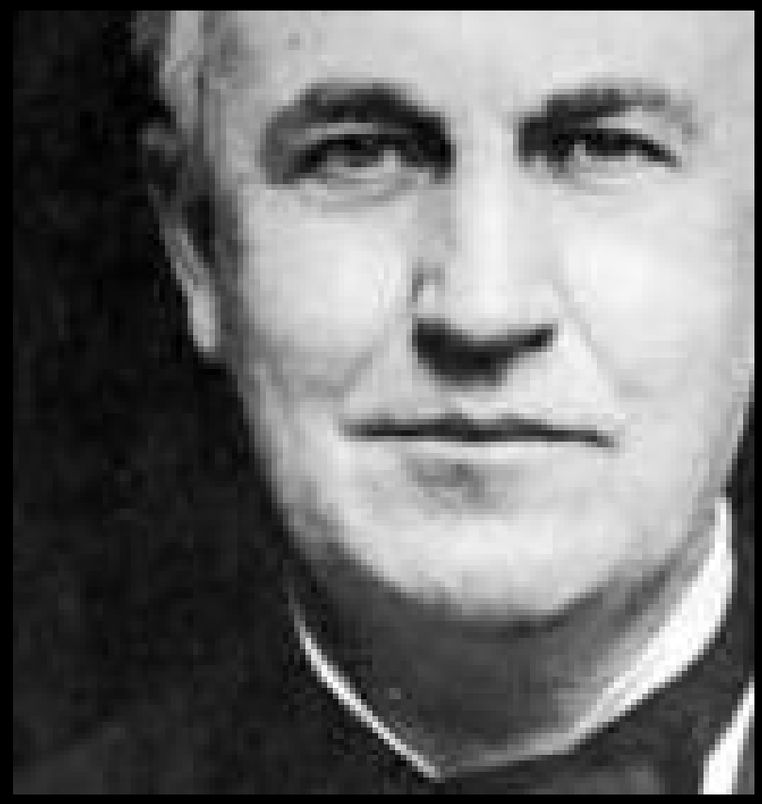




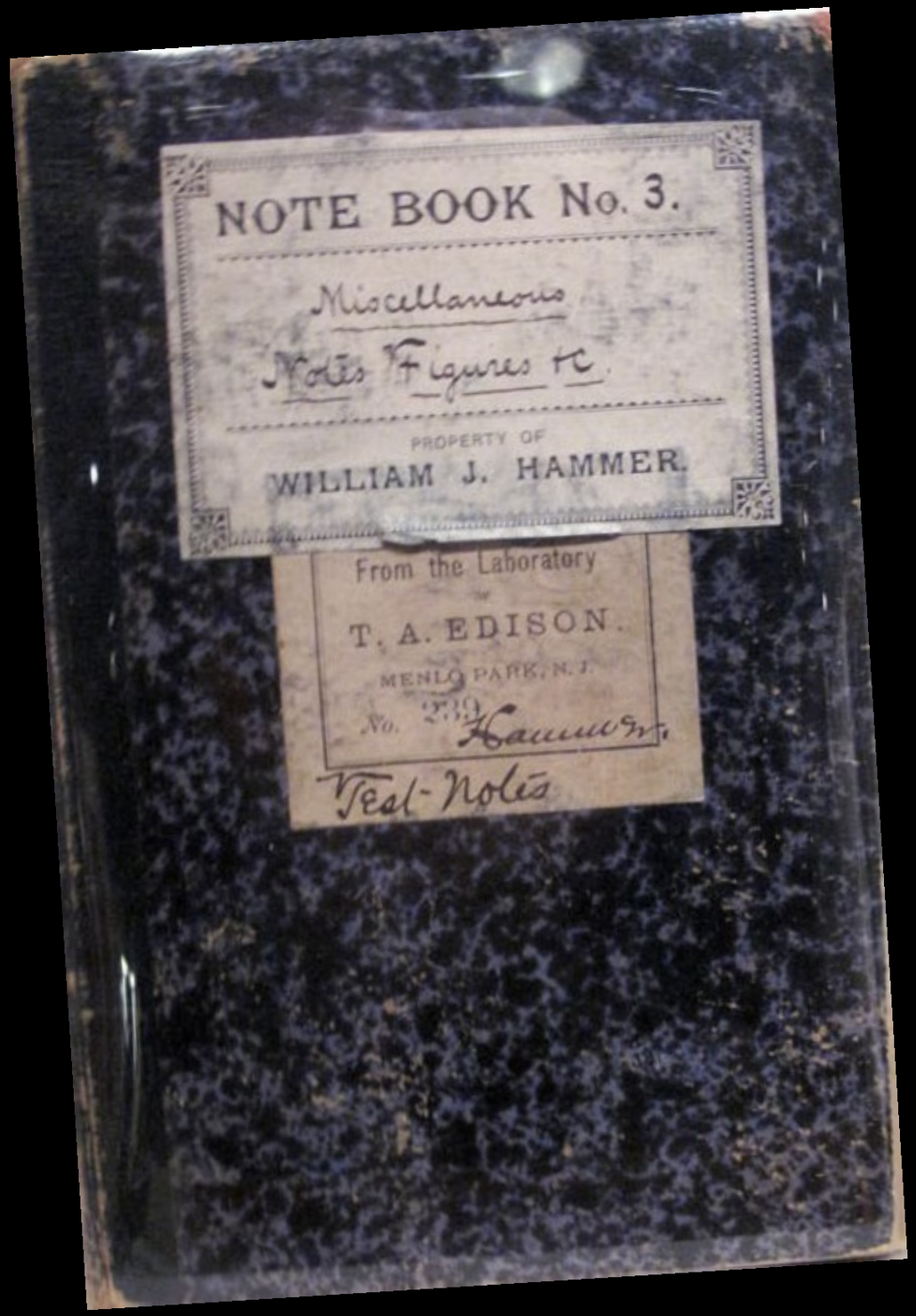



Digital surfaces
Portable personal devices
People
Information Appliances



3

Thomas Alva Edison | Inventor


NOTE BOOK No. 3.

Miscellaneous

Notes Figures &c.

PROPERTY OF

WILLIAM J. HAMMER.

From the Laboratory

of

T. A. EDISON.

MENLO PARK, N. J.

No. 239 Hammer.

Test-Notes

Source: The Thomas Edison Papers, Rutgers University
http://edison.rutgers.edu/

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MENLO PARK, N. J.

No. 239 Hammer

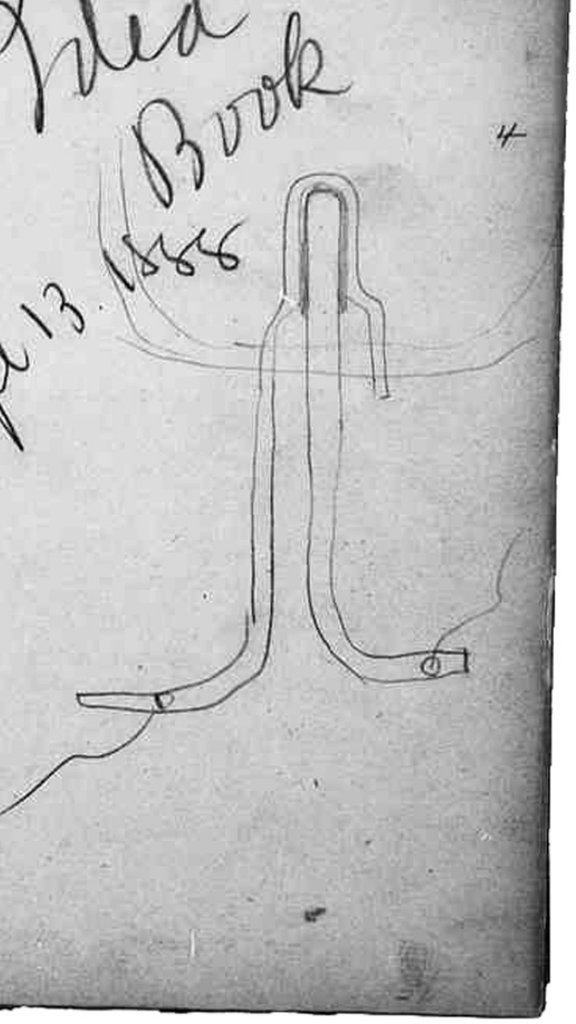
Test-Notes

-88-01-03.2

Idea Book

4

April 13 1886

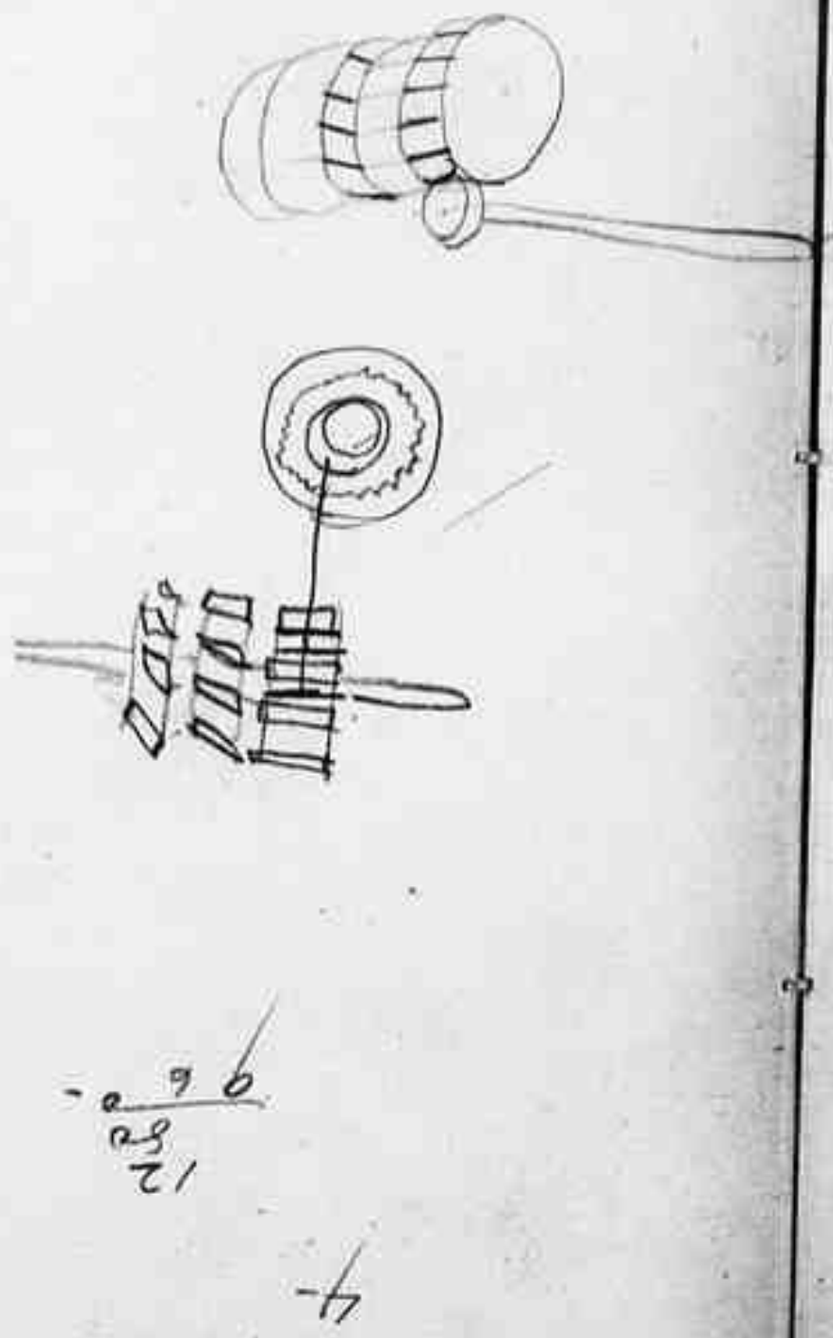


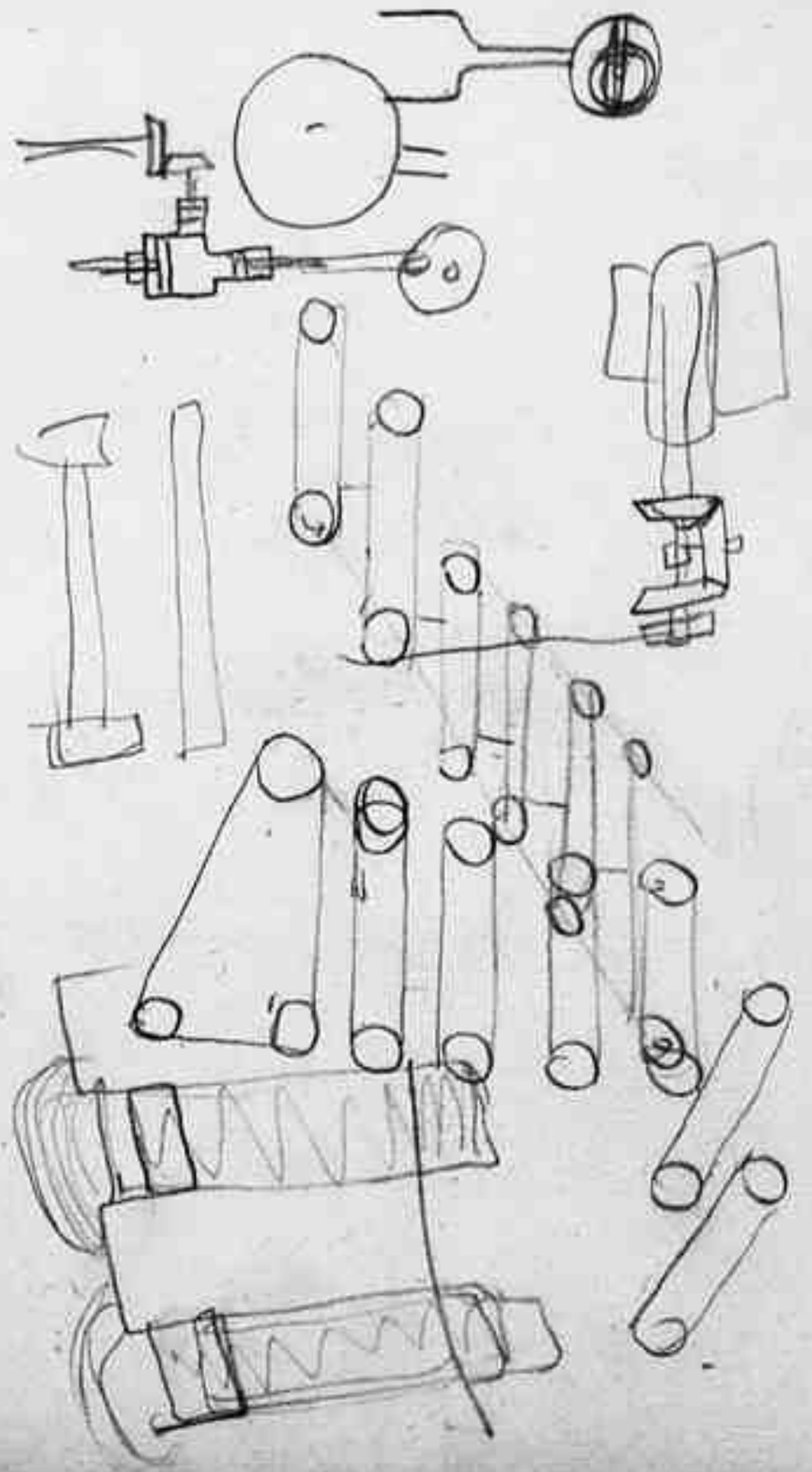
Source: The Thomas Edison Papers, Rutgers University
http://edison.rutgers.edu/

I'A E — Jany 3 1888

Things doing and to be done.

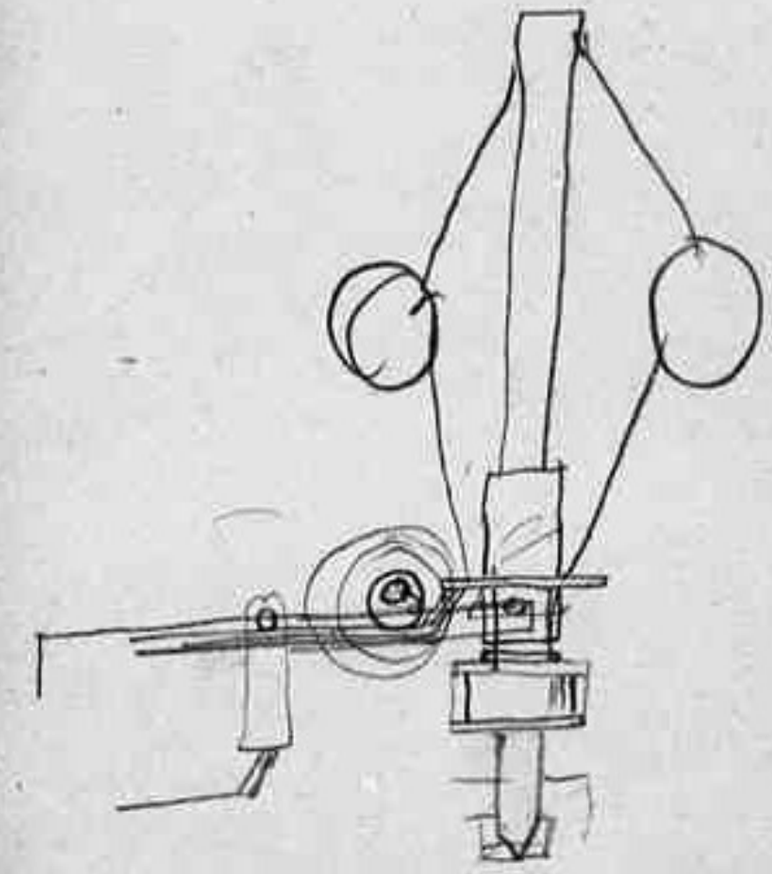
Cotton Picker
New Standard Phonograph
Hand turning phonograph.
New Slow Speed cheap Dynamo.
New Expansion Pyromagnetic Dynamo.
Deaf Apparatus
Electrical Piano
Long distance standard Telephone transmitter which employs devices of recording phonogh
Telephone Coil of Fe by H in Paraffine or other insulator
Platina Point Trans using new phono Recorder devices
Grid Battery for Telephones
" " " " Long Distance
" " " " Phonoplex
" " " " Jump telegraph
" " " " Voltmeter,
Improved Magnetic Bridge for practical work
Motograph Mirror
" Relay
" Telephone practical.
Artificial Cable.
Phono motor to work on 100 volt ckts
Duplicating Phono Cylinders
Deposit in Vacuo on Lace gold & silver also on Cotton Molten Chemical compound of lustrous surface to imitate silk - also reg plating system
Vacuous Ore milling Large Machine,
Magnetite Separator Large "
Locking Material for Iron Sand.

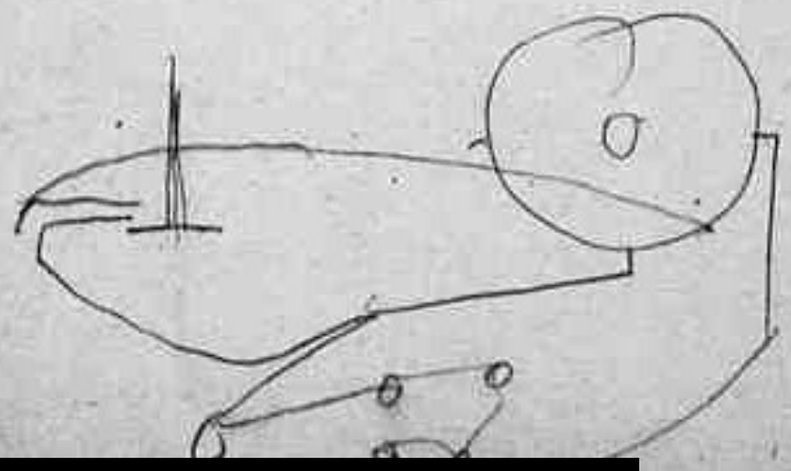




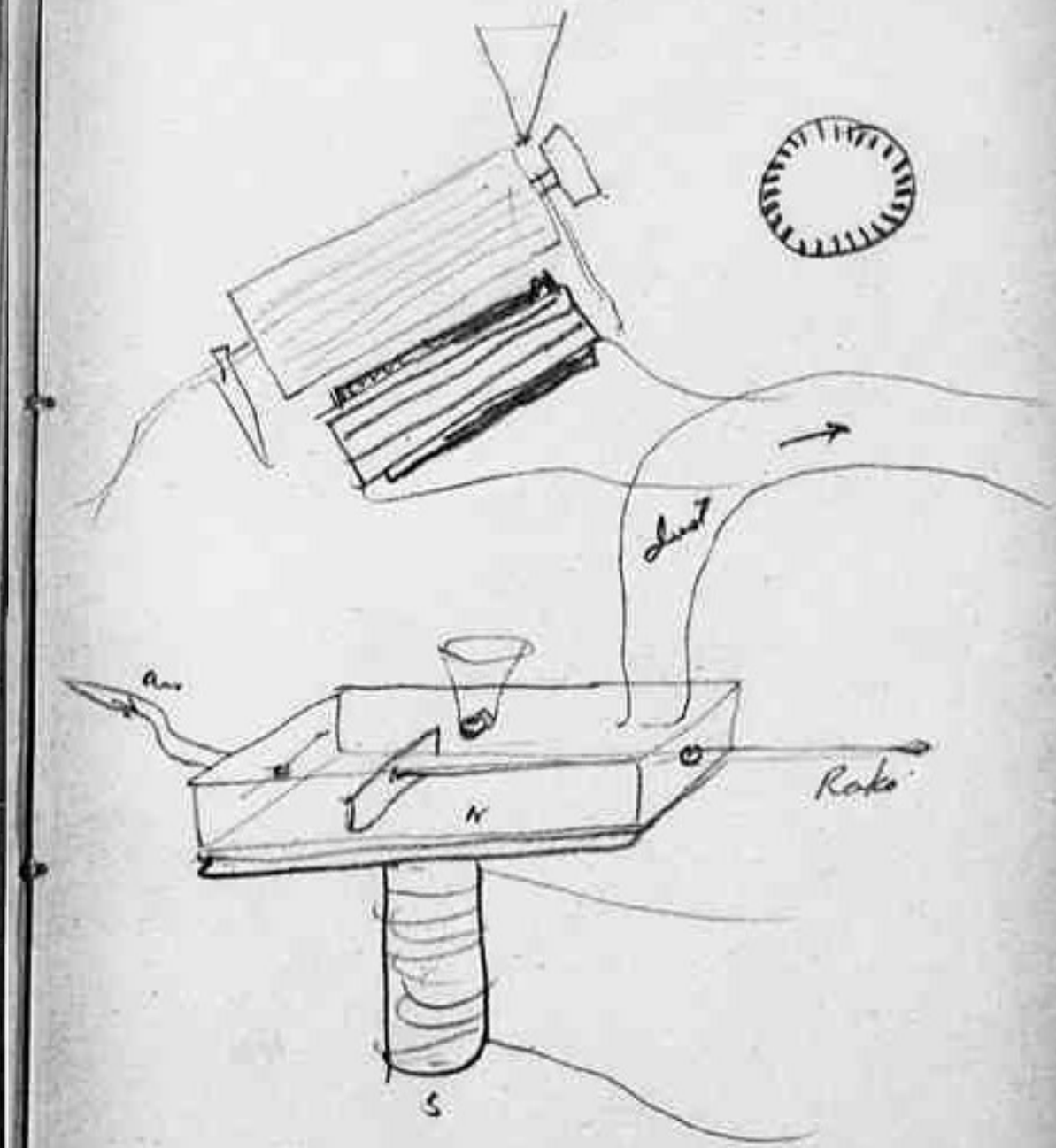
Source: The Thomas Edison Papers, Rutgers University
http://edison.rutgers.edu/

Por

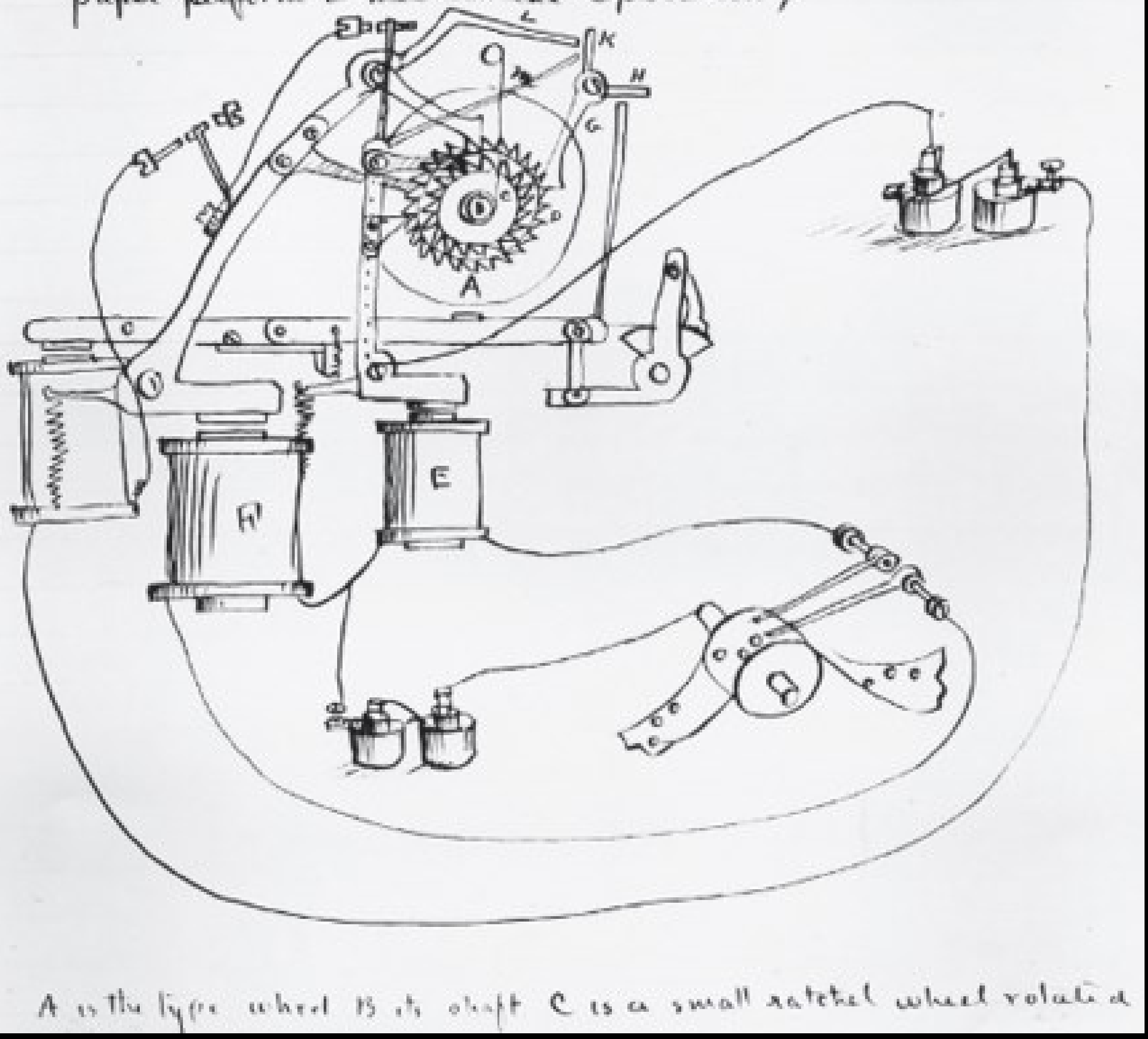




Caveat april 29. 89



The Printer which I propose to use for translating from the punched or embossed paper, is as follows though I may improve it in time or adopt an entirely new one using Magnetism or dispensing with it and make the paper perform a mechanical operation,



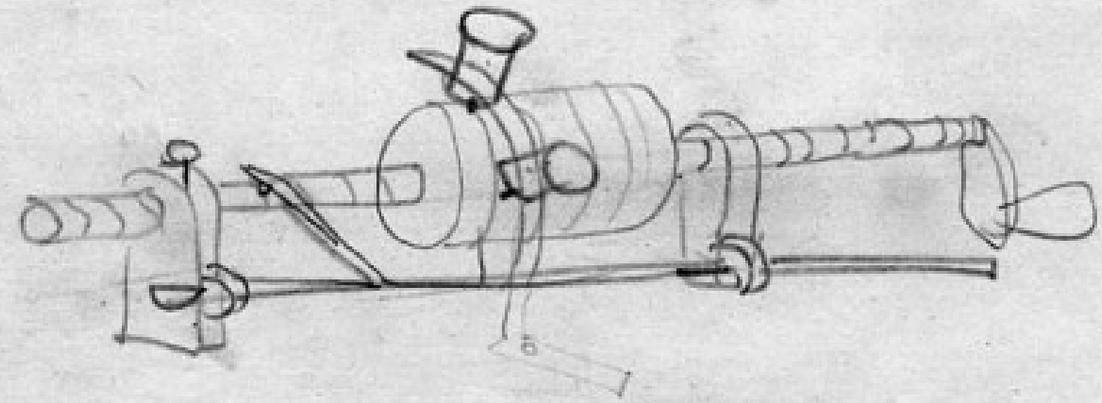
A is the type wheel B its shaft C is a small ratchet wheel which

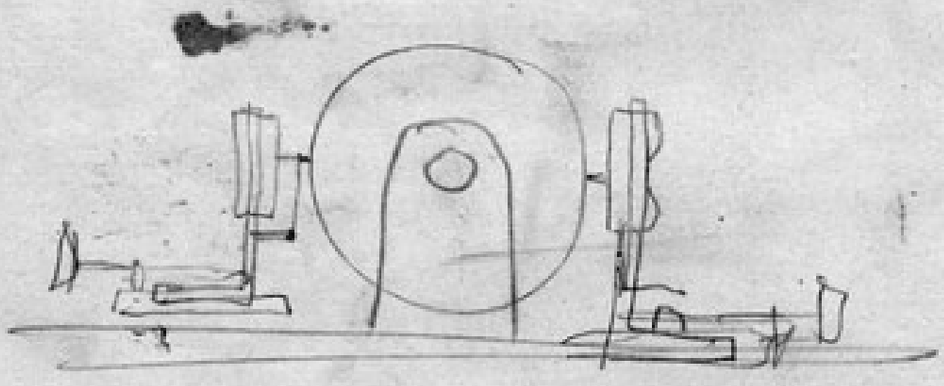
Phonograph 1877 Notes Longest

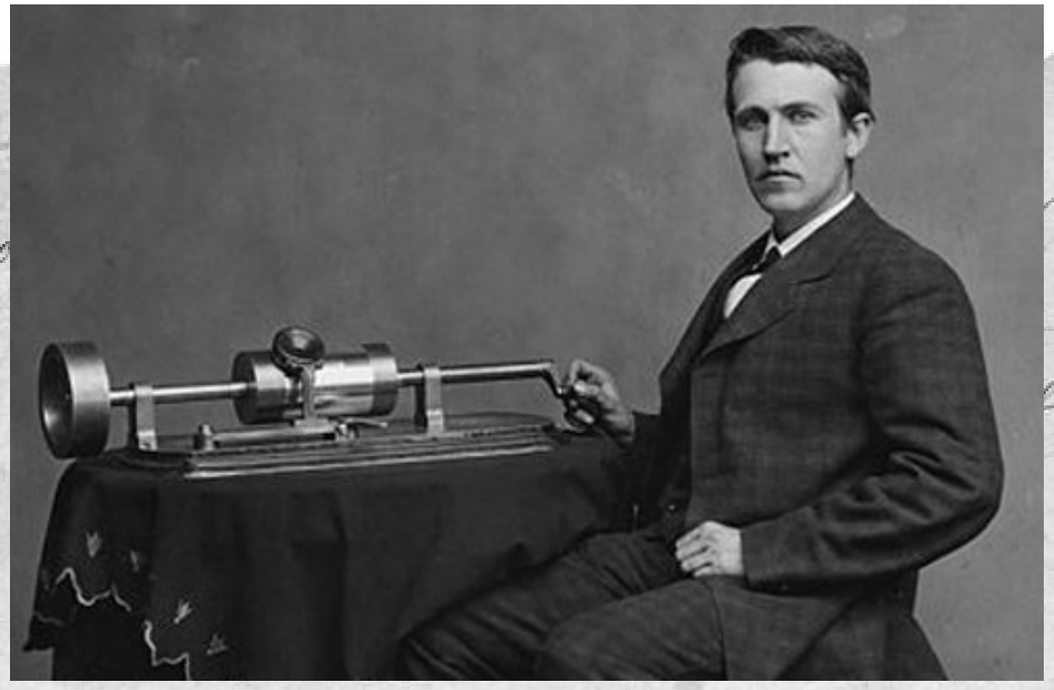
582

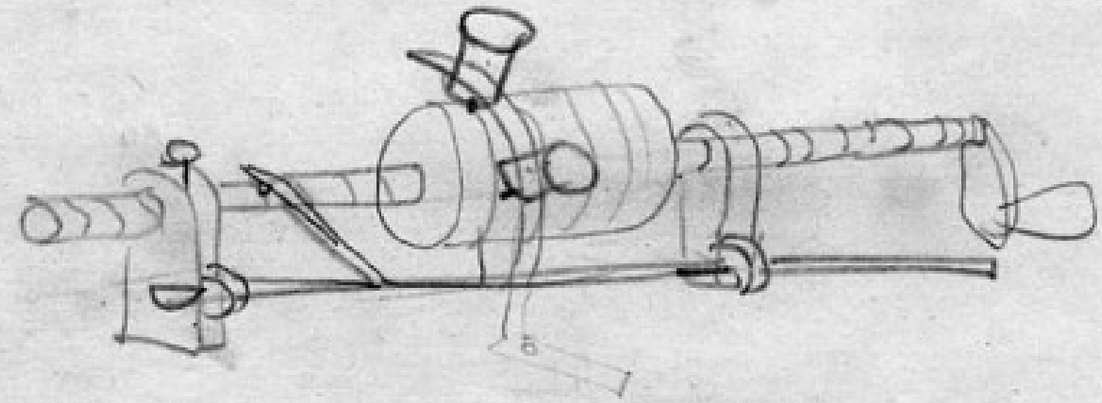
Phonograph.

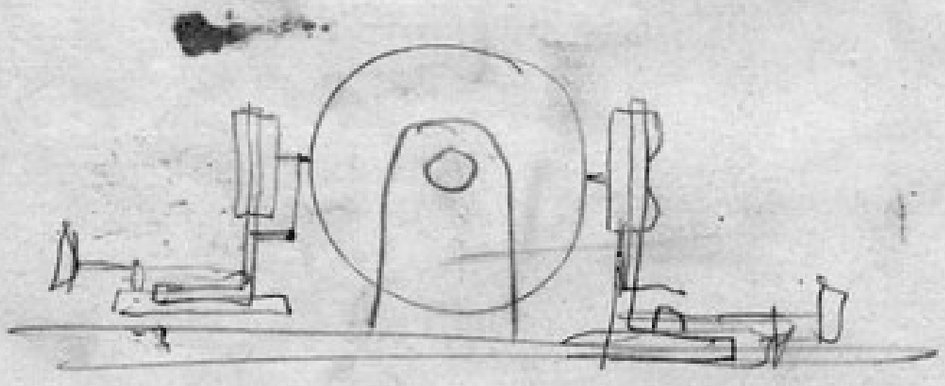
Nov 20th 1877
T A Edison
Chas Batchelor
J Kruesi.





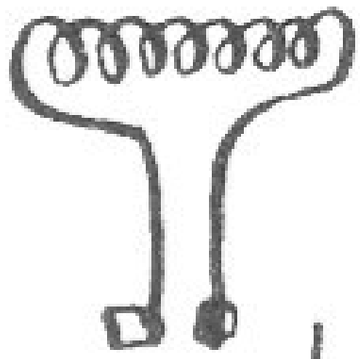


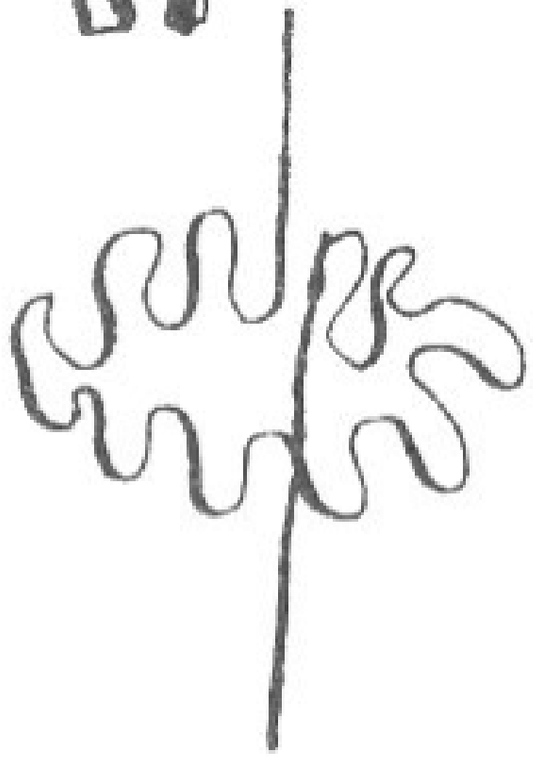


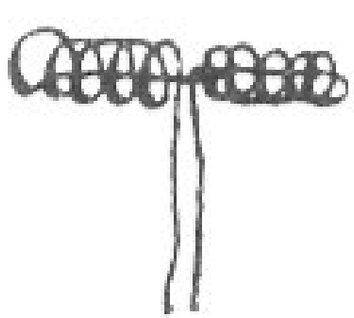


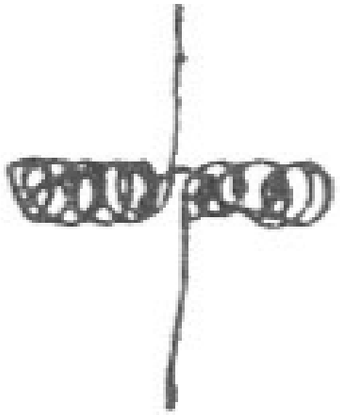
Source: The Thomas Edison Papers, Rutgers University
http://edison.rutgers.edu/

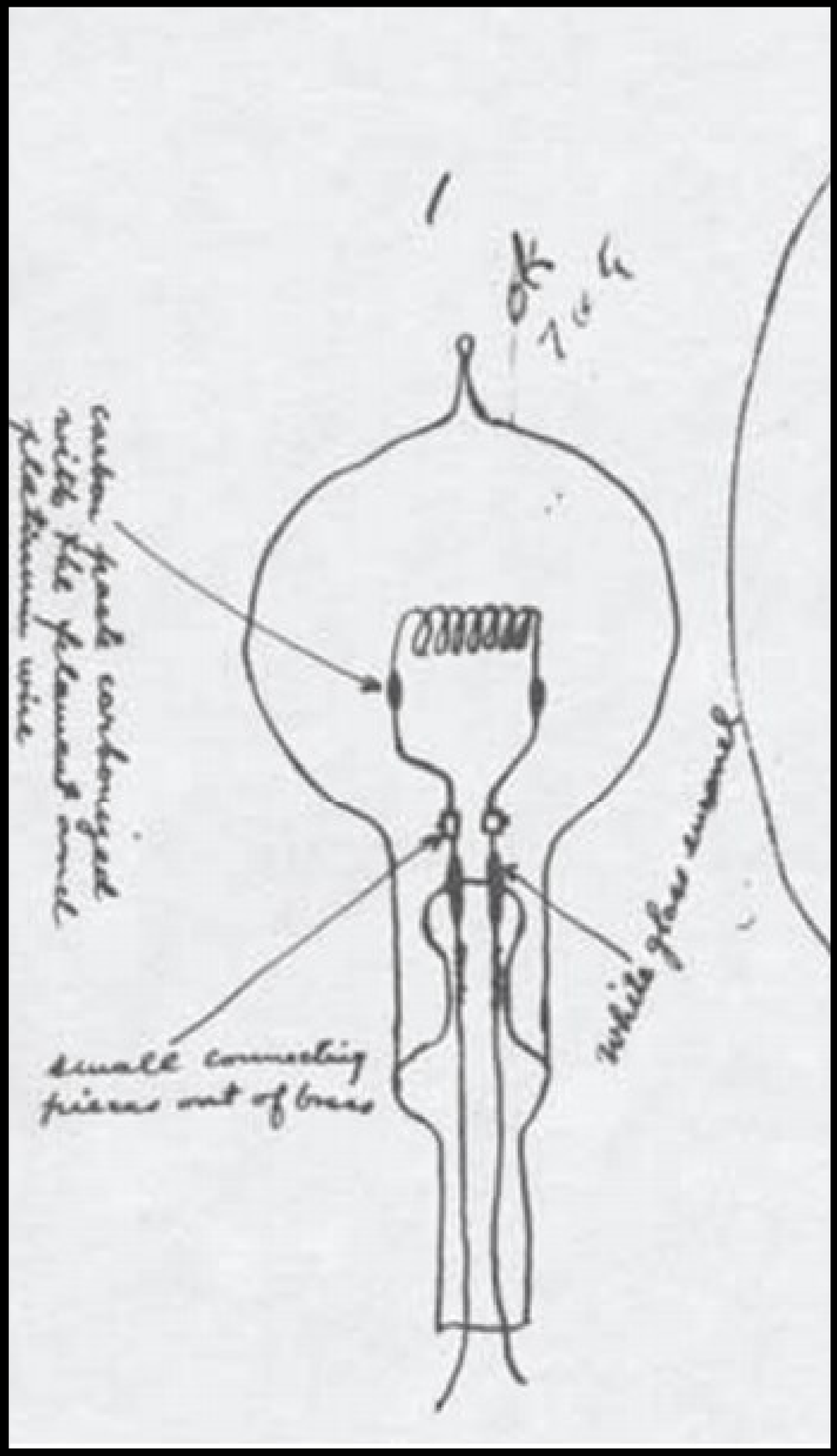
forms of spiral

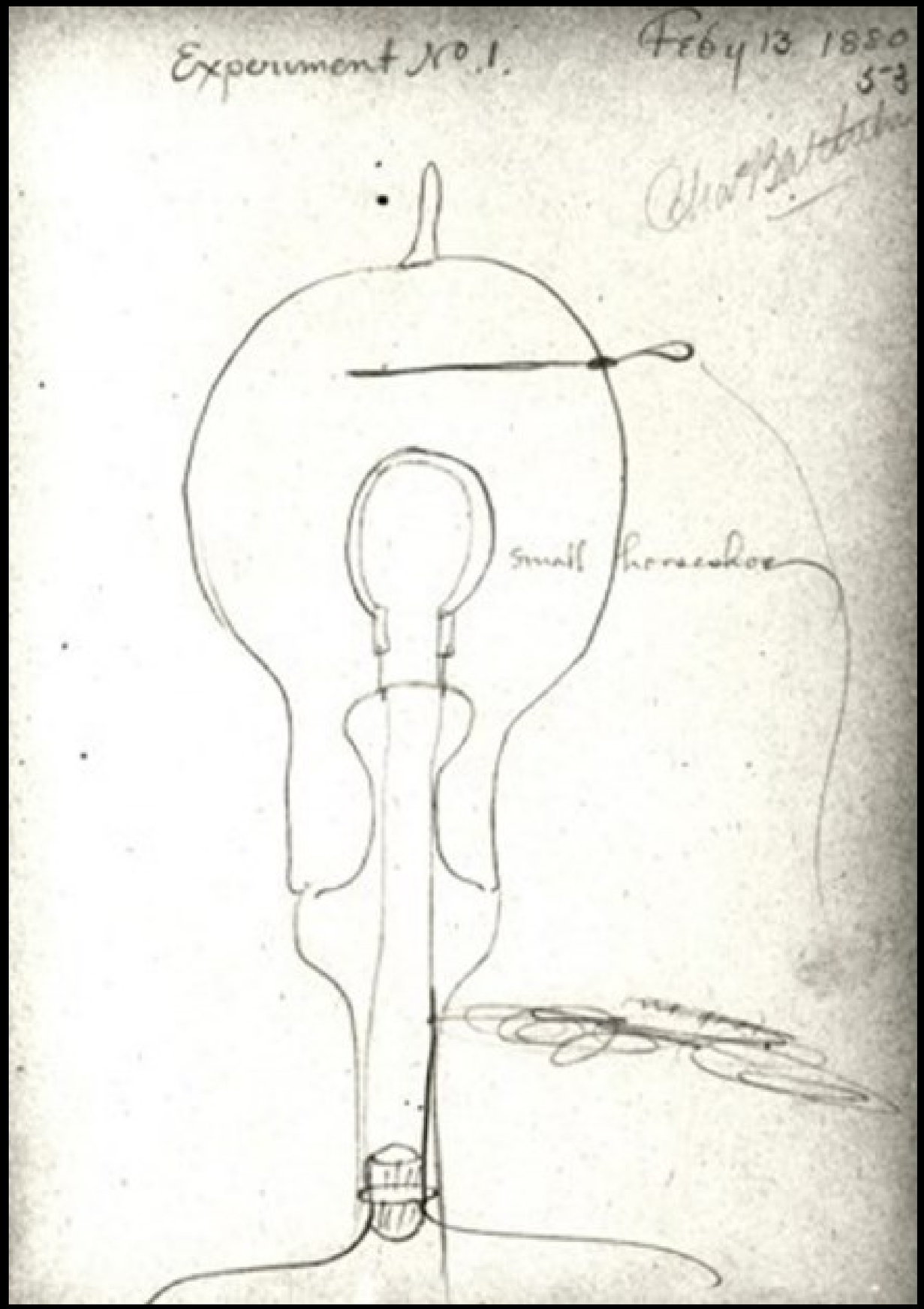












Source: The Thomas Edison Papers, Rutgers University
http://edison.rutgers.edu/

Suggest and explore rather than confirm

Edison and his staff
created over

2,500

notebooks with
200-300 pages each

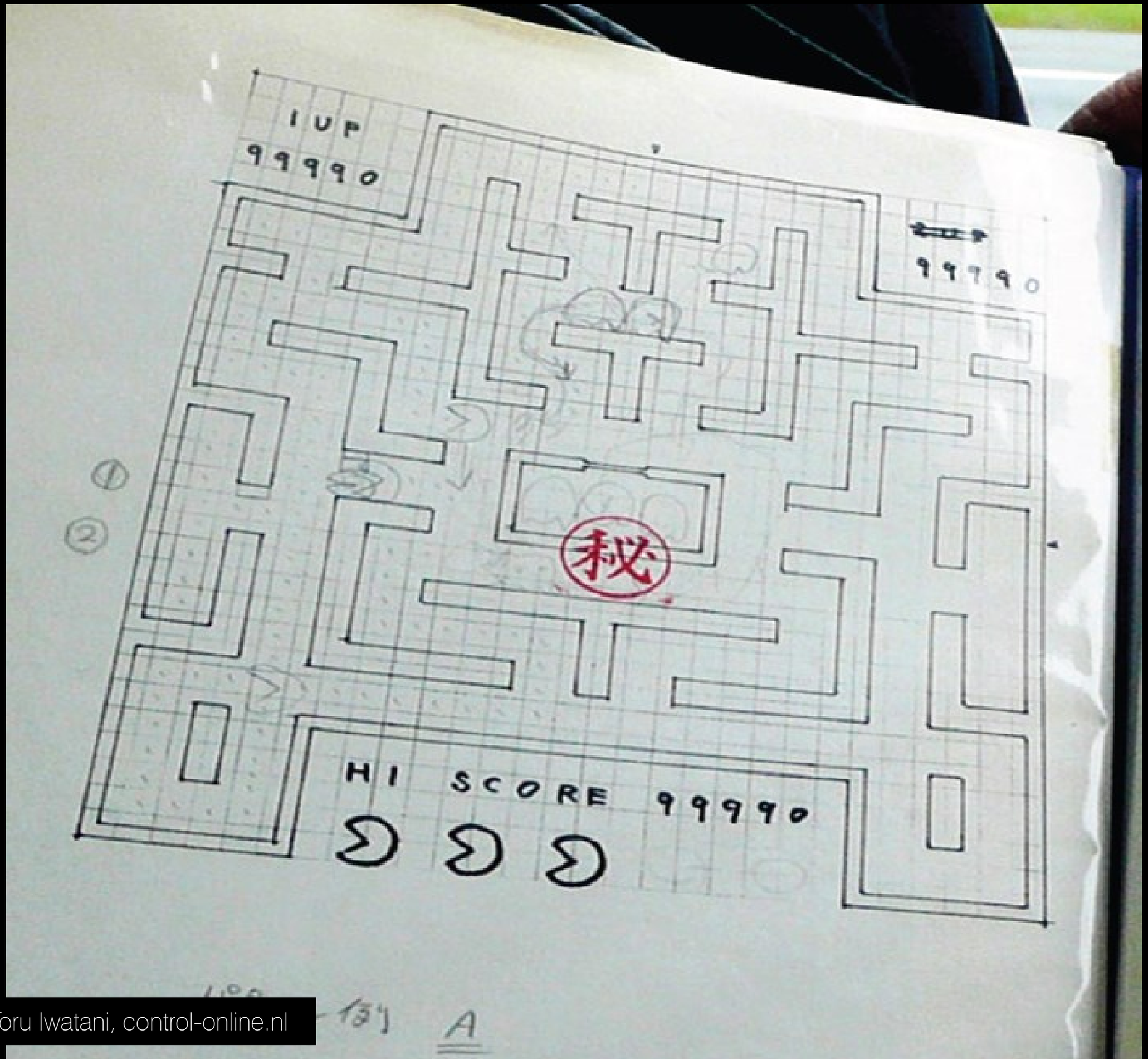
Toru Iwatani | Designer

4

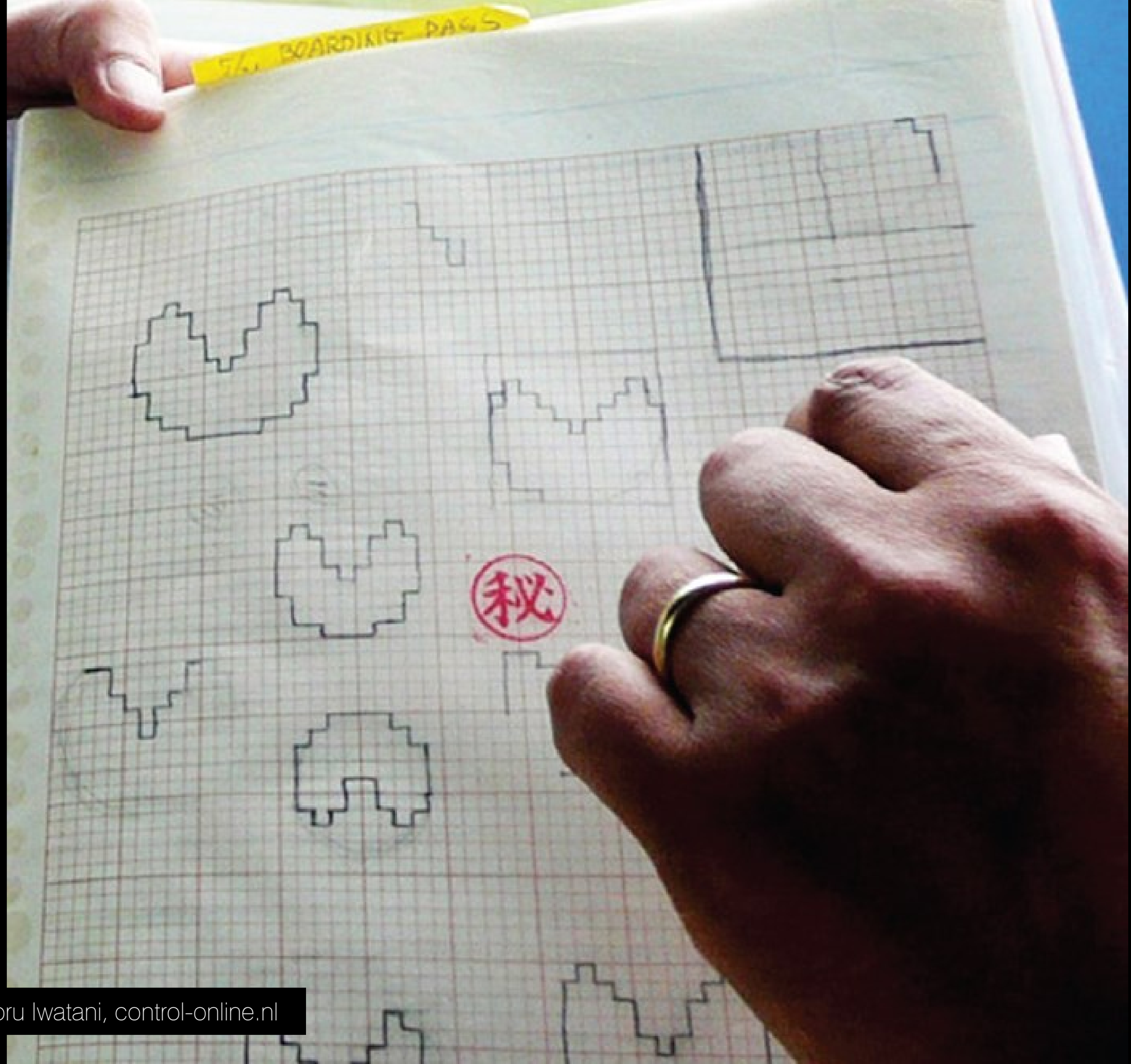
Toru Iwatani | Game Designer

Source: Toru Iwatani

Source: Toru Iwatani, control-online.nl



Source: Toru Iwatani, control-online.nl



Source: Toru Iwatani, control-online.nl

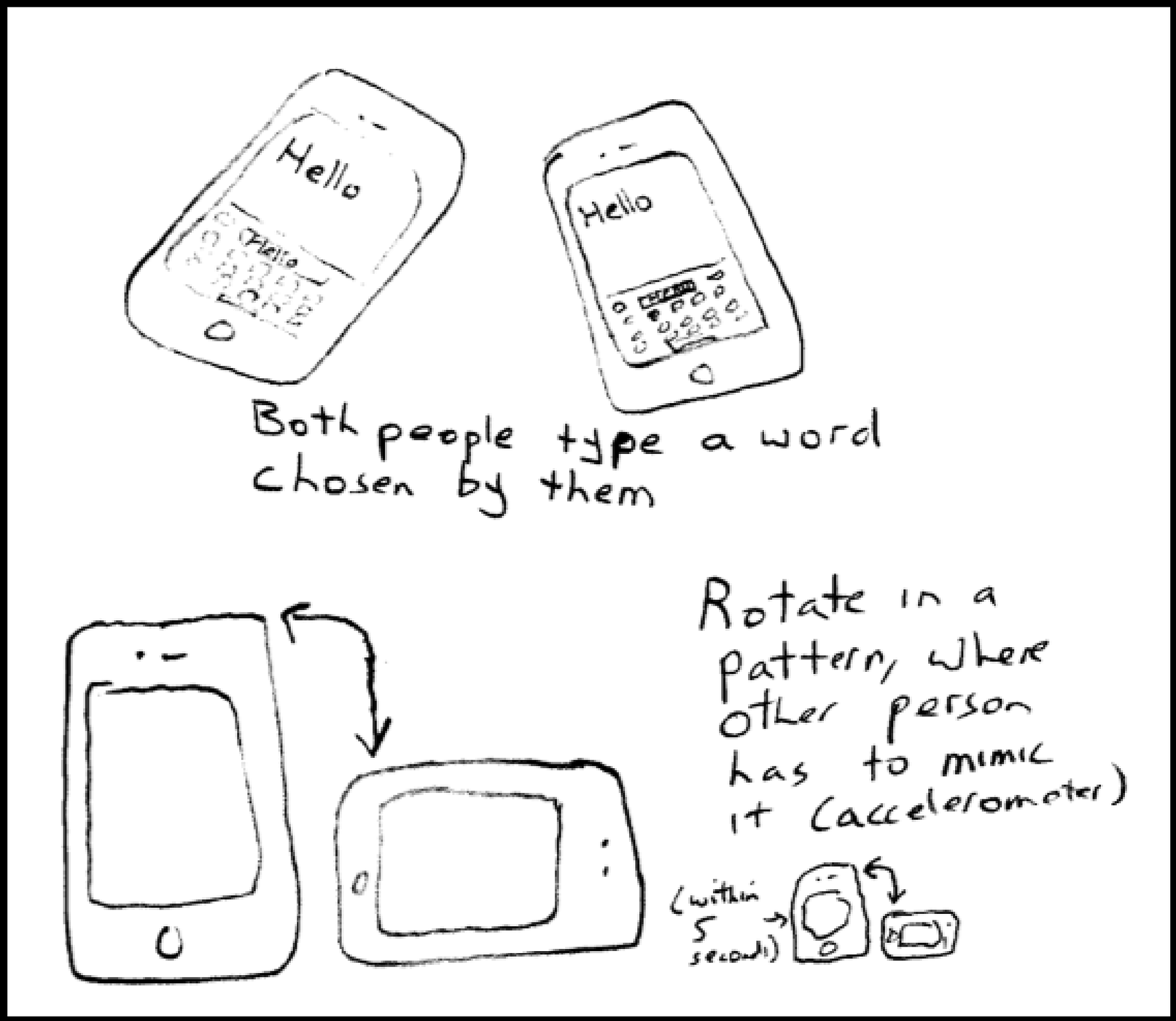
Quick and Inexpensive

Technique: **10 plus 10**

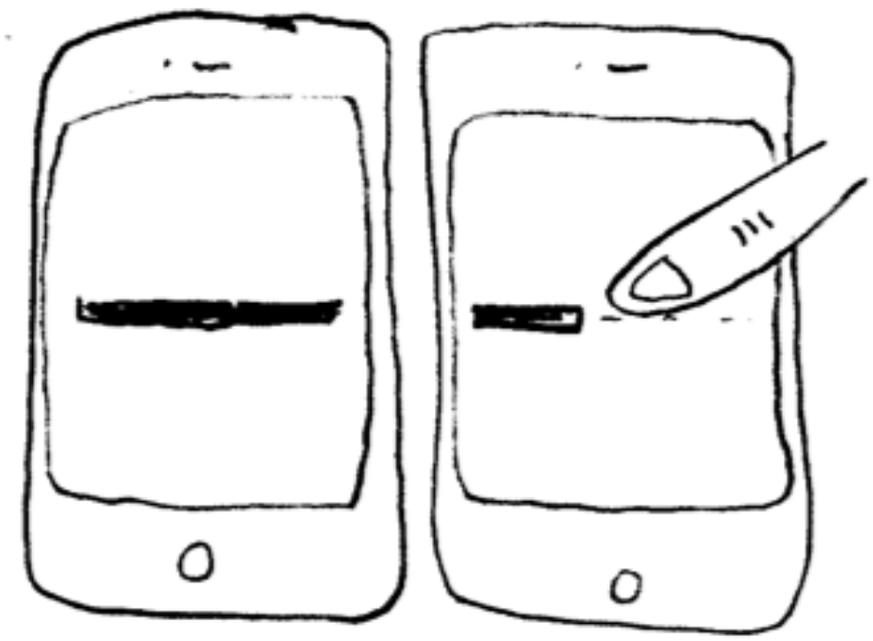
Technique: **10 plus 10**

1) State the design challenge
2) Generate 10 different designs –
   as creative and diverse as possible
3) Reduce the number of design concepts
4) Choose the most promising designs as a starting point
5) Sketch 10 details and/or variations of design concepts
6) Present ideas to a group
7) As your ideas change, sketch them out.

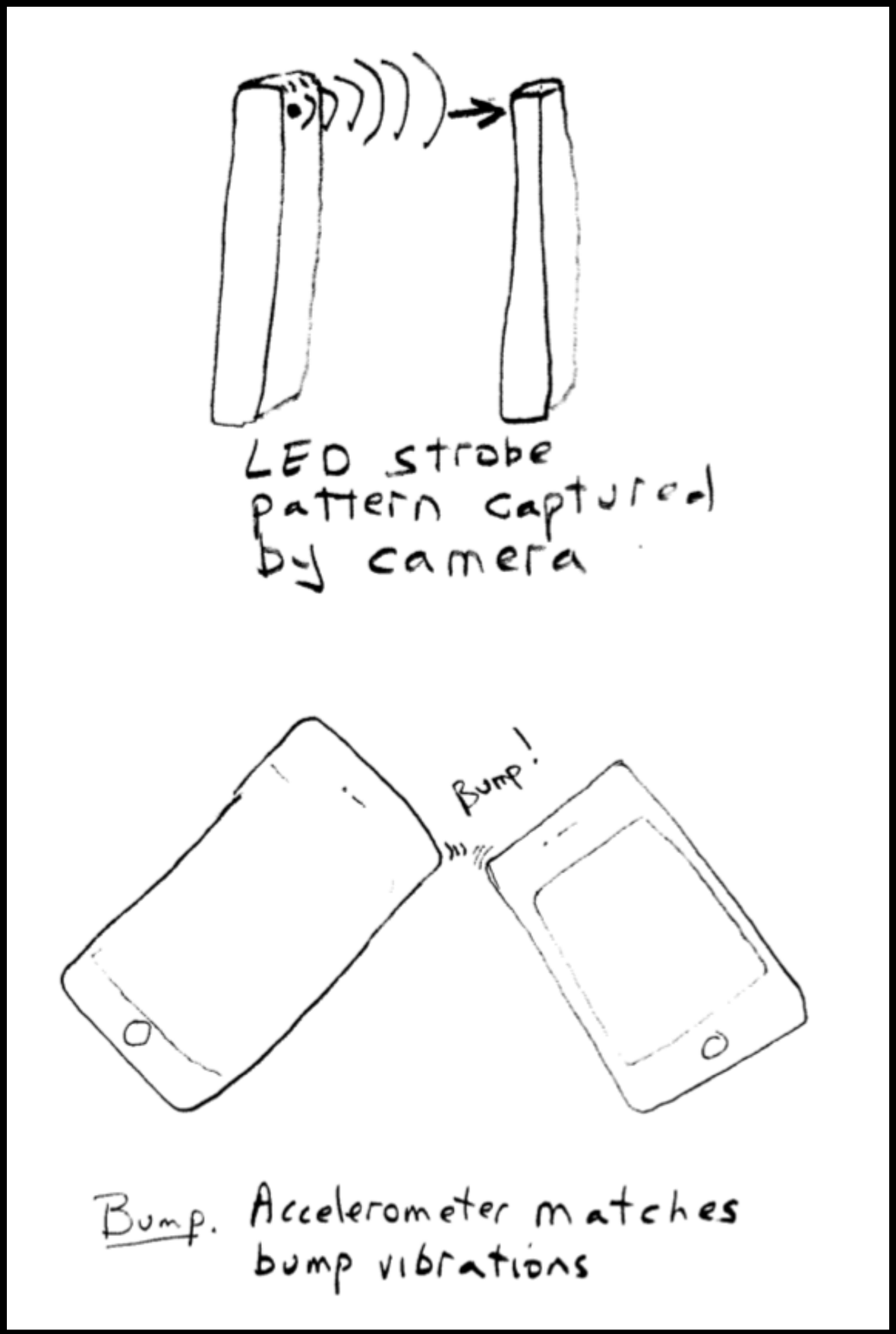
Technique: **10 plus 10**



Greenberg et al. [2]

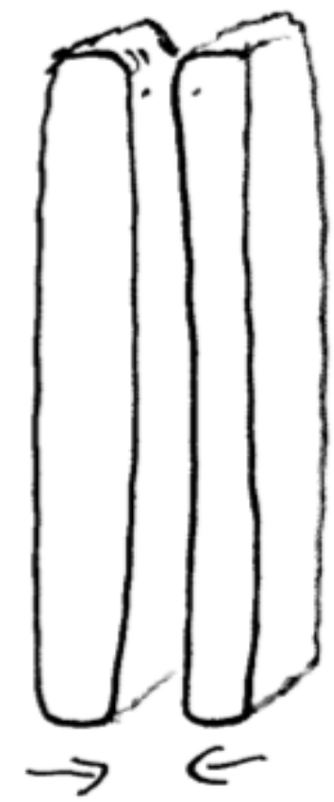


Greenberg et al. [2]



Greenberg et al. [2]

Faint musical sound played on one device picked up by the other device



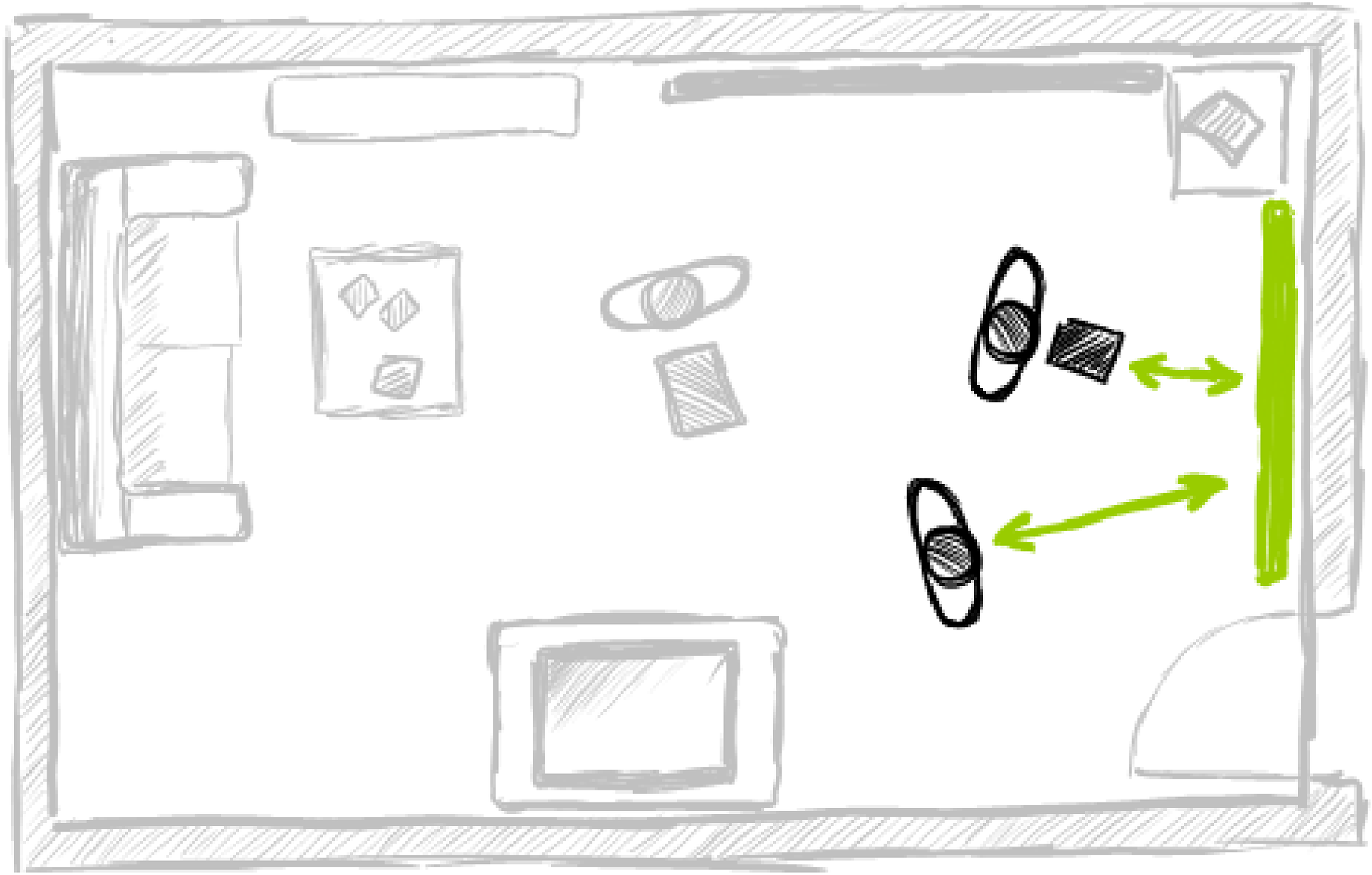
Ambient light sensor

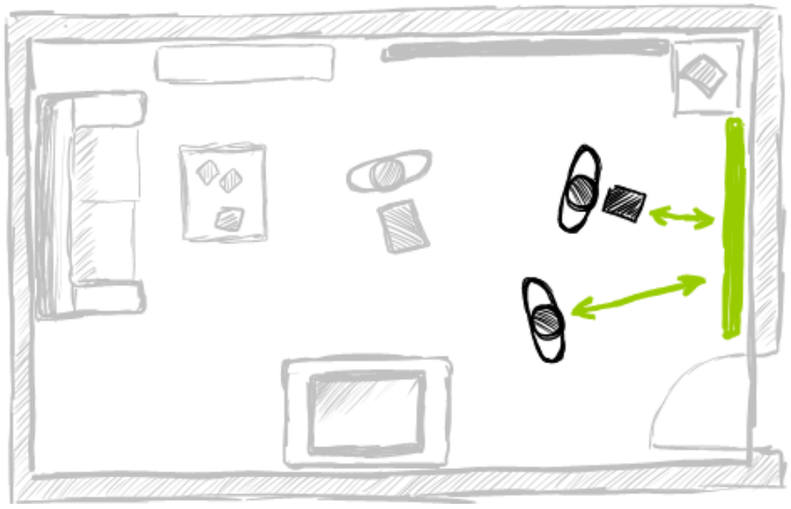
Touch surfaces together in a pattern; Both detect same light/ dark pattern

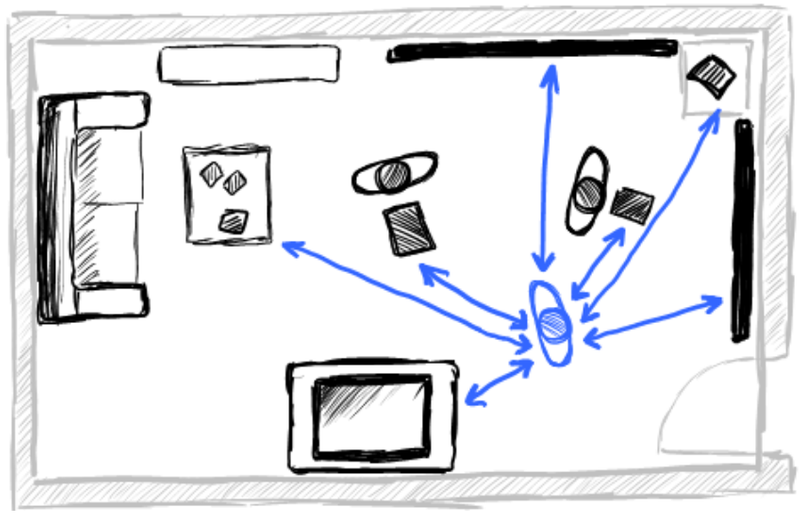
Greenberg et al. [2]

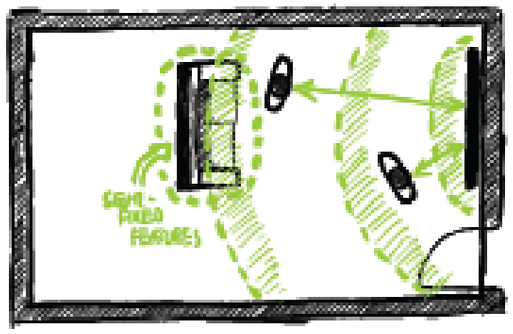
Live sketching:

10 plus 10 strategy



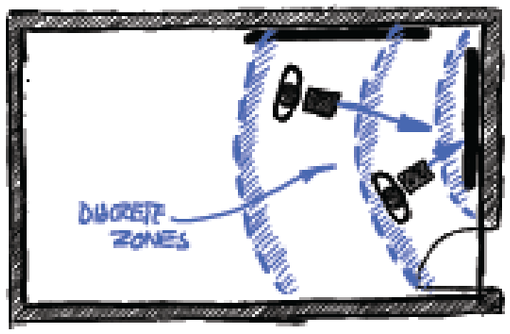






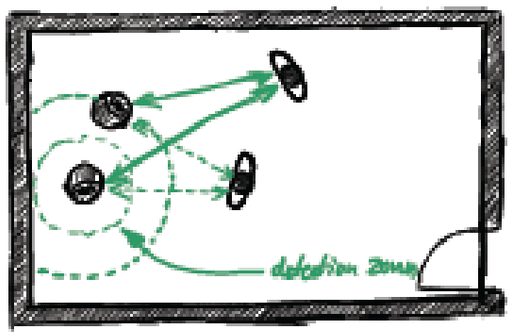
PERSON-TO-LARGE DIGITAL SURFACE

Continuous measurements to discrete proximity zones



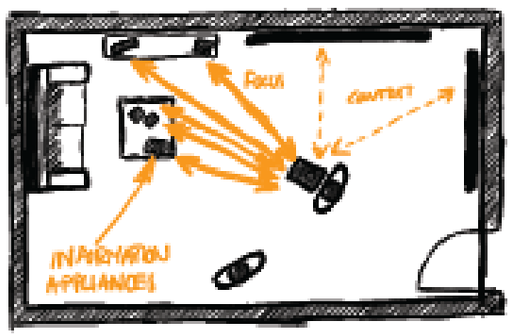
DEVICE-TO-LARGE DIGITAL SURFACE

Proximity zones around large digital surface trigger transitions on portable personal devices.



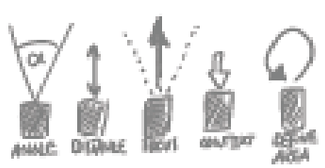
PERSON-TO-DOMESTIC ROBOT

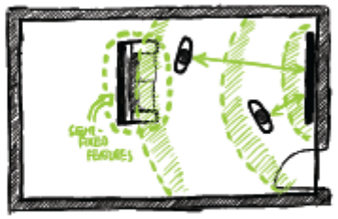
Proximity - same environment, same space, different time (asynchronous)



DEVICE-TO-DEVICES (MULTIPLE, LARGE QUANTITIES)

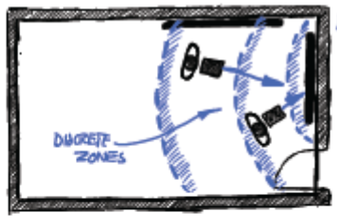
orientation and physical distance as filter for distinct interaction





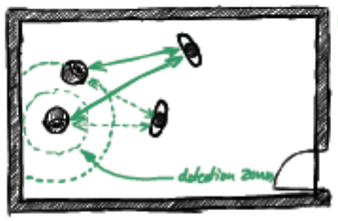
PERSON-TO-LARGE DIGITAL SURFACE

Continuous measurements to discrete proximate zones



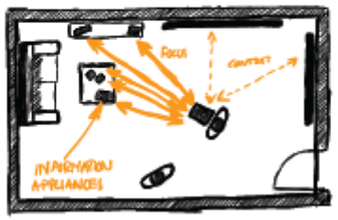
DEVICE-TO-LARGE DIGITAL SURFACE

Proximate zones around large digital surface trigger reaction on portable personal devices.



PERSON-TO-DOMESTIC ROBOT

Proximity - same environment, same space, different time (expectations)



DEVICE-TO-DEVICES (MULTIPLES, LARGE QUANTITIES)

orientation and physical distance as filter for device selection

PERSON-TO-DEVICE-TO-DEVICE

orientation (angle/pointing) and length of device distance

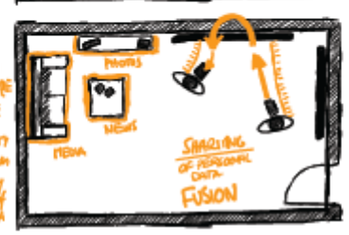
- device relative to person & device to device

"PAIRING" EXAMPLE

PERSON-TO-LARGE DIGITAL SURFACE (HORIZONTAL TABLETOP)

(& DEVICE-TO-LARGE DIGITAL SURFACE)

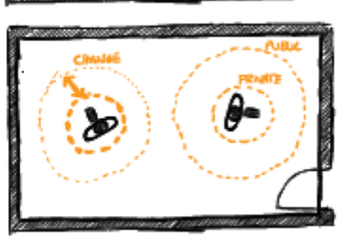
- Related to „Above the surface" project



PERSONAL PORTABLE DEVICE-TO-DEVICE

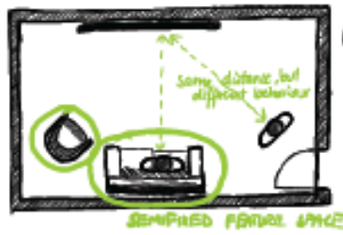
LARGE INTERACTIVE SURFACE AS MEDIATOR → FEEDBACK

CONTINUOUS INPUT MAPPED TO CONTINUOUS OUTPUT (BROWSING SIZE, VISIBILITY/AVAILABLE ITEMS)



PERSONAL PORTABLE DEVICE-TO-DEVICE

(PROXIMITY-AWARE RFID TAGS)

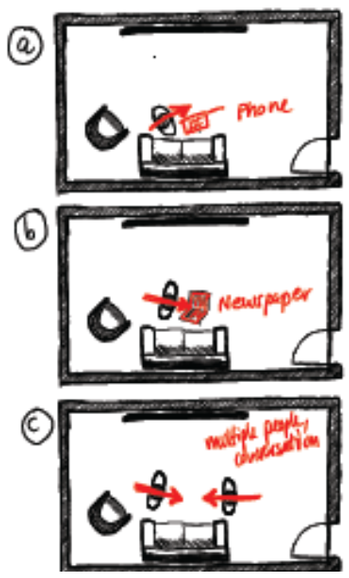


① SEMI-FIXED FEATURE SPACE

Different to

- David Vogel: Hinckley "it's systems where distance, but not angle, is considered

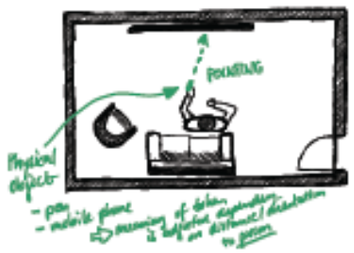
② ATTENTIVE USER INTERFACE



ORIENTATION + OBJECT OR PERSON

→ different to previous attention: user behaviors: what object ??

③ PHYSICAL TOKENS TO MEDIATE EXPLICIT INTERACTION



Different from

- pointing devices
- remote control
- gesture interfaces

Basic: to project ideas in particular orientation and distance to a person

④ AWARENESS TO INTERACTION

CONTINUOUS: • SIZE OF ICON & INFORMATION

• location on screen

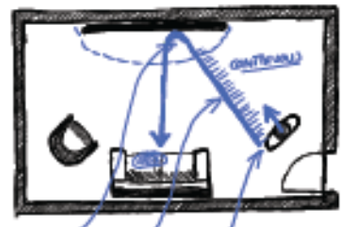
DISCRETE: ONCE IN CLOSE DISTANCE TO SCREEN, FIXED SIZE

Different from

- Gellersen's RELATE gateways

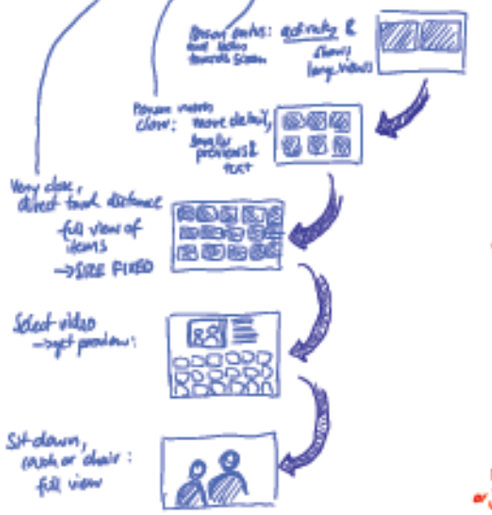
→ Dynamic size, increasing information

→ from awareness to interaction



⑤ CONTINUOUS KNOWLEDGE OF...

a) DISTANCE
b) ORIENTATION
c) IDENTITY
d) VELOCITY



to a) Distance

Continuous:
- size of previews
- appearance icons of identity

Discrete:
- direct touch interaction
- enter / leave semi-fixed feature

to b) Orientation

Continuous orientation:
Person (discrete):
- facing towards ambient display
- facing towards another person

Device (continuous)?:
- fine positioning
- relative orientation

to c) Identity

implement? or just mention

Person:
- History → resume past playback
- Preferences → show personal media library → set volume
- Security / Roles → Validation, Management

Device:
→ Identity of device for docking

to d) Velocity

Person / Device / Object → pointing & selection ?

⑥ HOME MEDIA PLAYER APPLICATION

Vgl. - Augmented Whiteboard (Ju)
- Peddle Ambient Display (Vogel)

"perceive information flow, regulate levels implicit and explicit interaction"

IMPLICIT

a) Activate / deactivate
- person entering & facing display
- e.g.: person leaves

b) Overview of available media
→ more detail when moving closer (continuous)

c) Awareness of access possibilities with digital devices

EXPLICIT

a) Direct touch interaction in front of it

b) Media transfer when device & person close to the screen

c) Pointing from a distance

confirm / confirm

d) Mediate between multiple people
- Show title on top of the screen for 2nd person
- Show detailed information for 2nd person
- person in front of the screen = identity, view and transfer gets detailed controls & full information

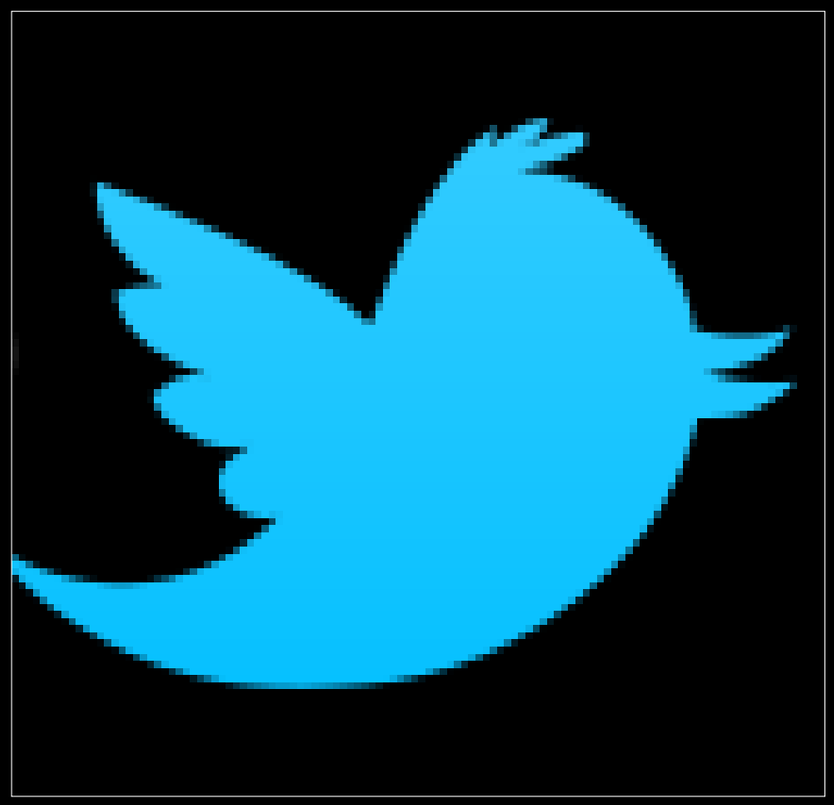
e) Attention UI, examples
- Incoming phone call
- Attention to newspaper
- Conversation between people

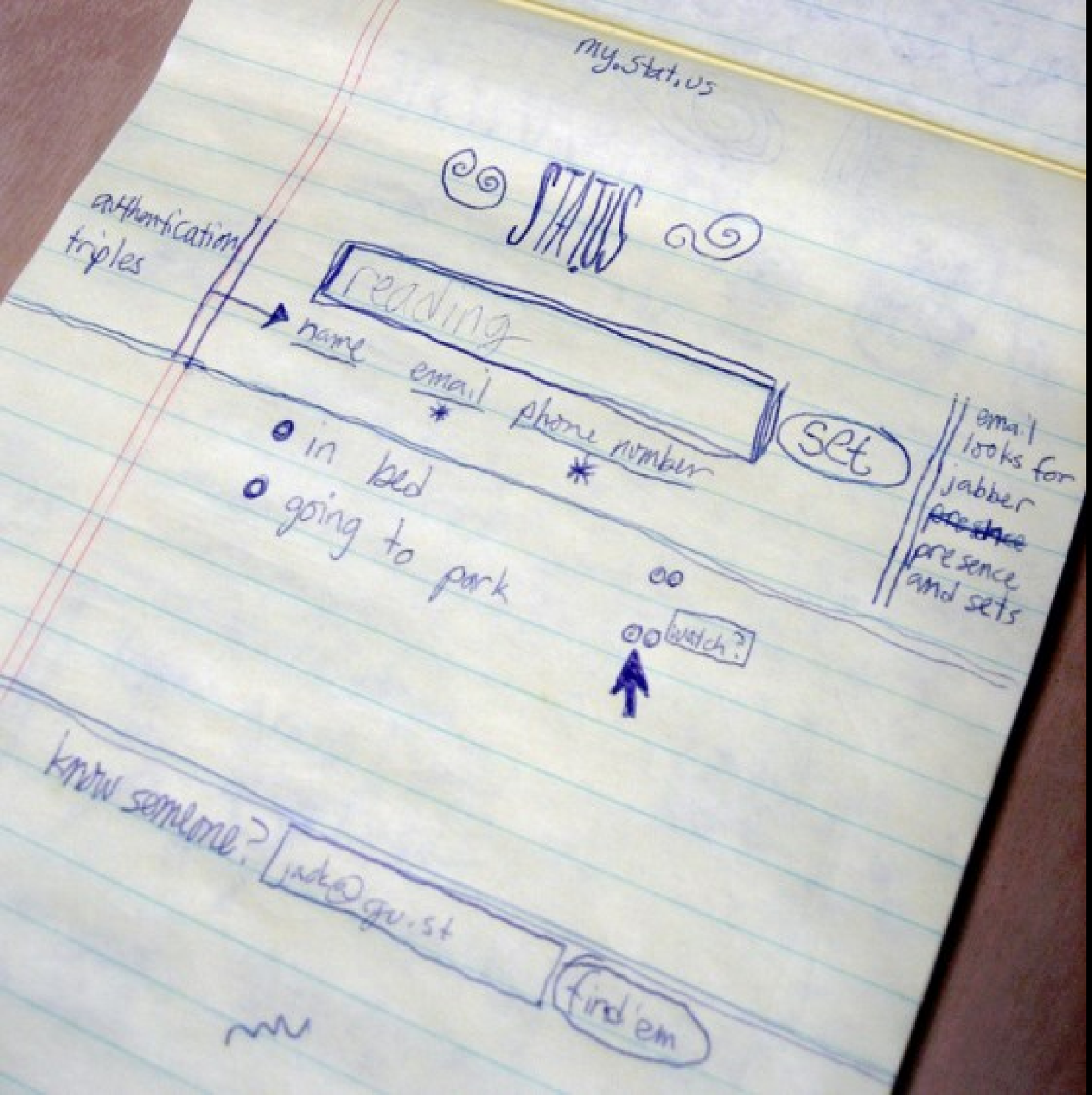
f) Identity
- History → continue playback
- Preferences → show personal media library → set volume
- Security → children safeguard

g) Semi-fixed feature space
same distance, but: standing / sitting on couch / chair

OVERRIDE MECHANISMS
1. Step back, increase distance
2. Turn around
3. Explicit gesture (with mobile device)
4. Timeout ("ignore")
5. Discrete command
6. Settings
7. "blacklist" for devices

Jack Dorsey | Software Architect





Source: Jack Dorsey
http://www.flickr.com/photos/jackdorsey/182613360/

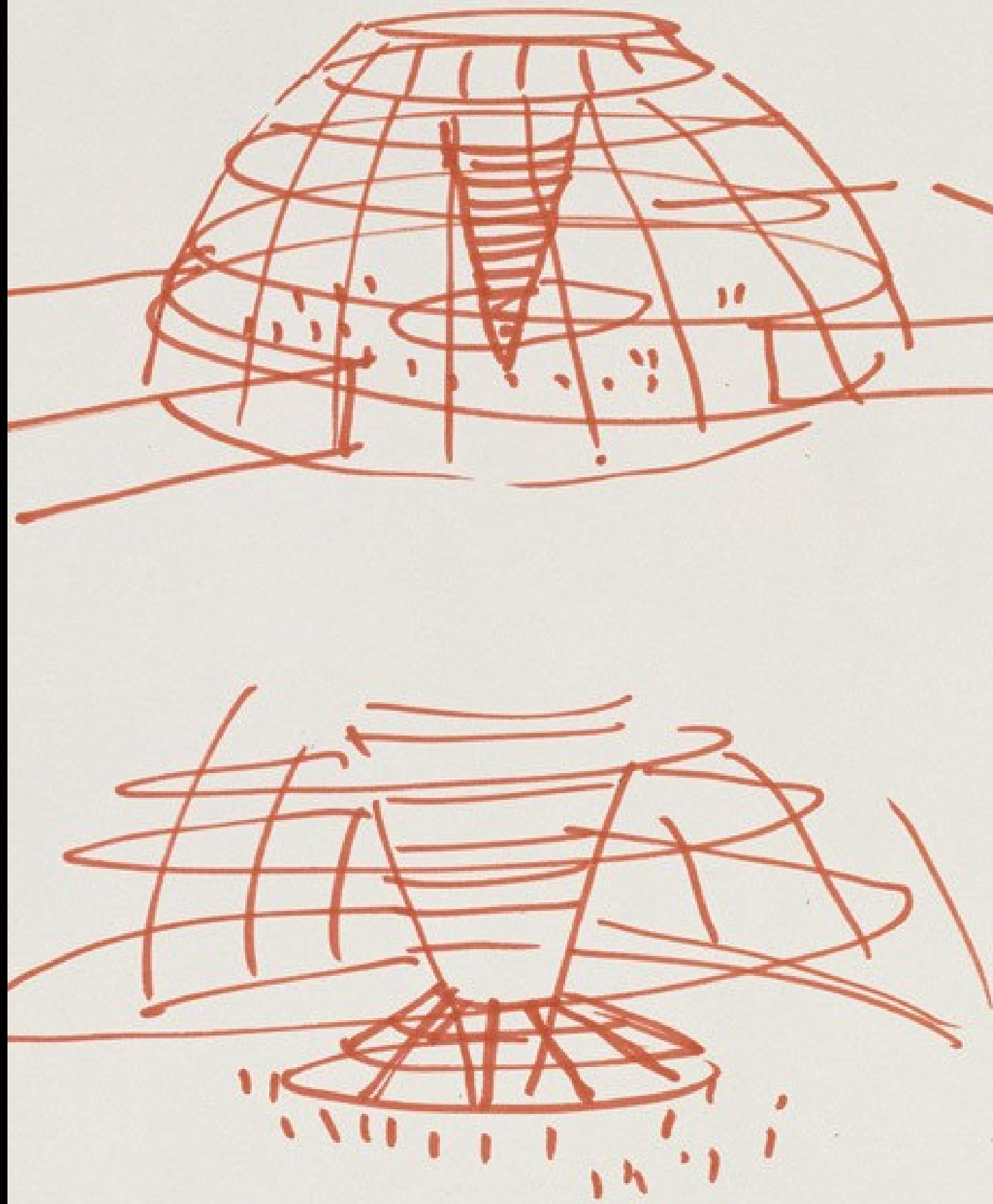
Timely

Sir Norman Foster | Architect


Dem Deutschen Volke

Source: Norman Foster

Source: Norman Foster



Source: Norman Foster

Disposable

Disposable

"If you can not afford to throw it away, it's very likely not a sketch"

Sketching Shortcuts: **Hybrid Sketches**

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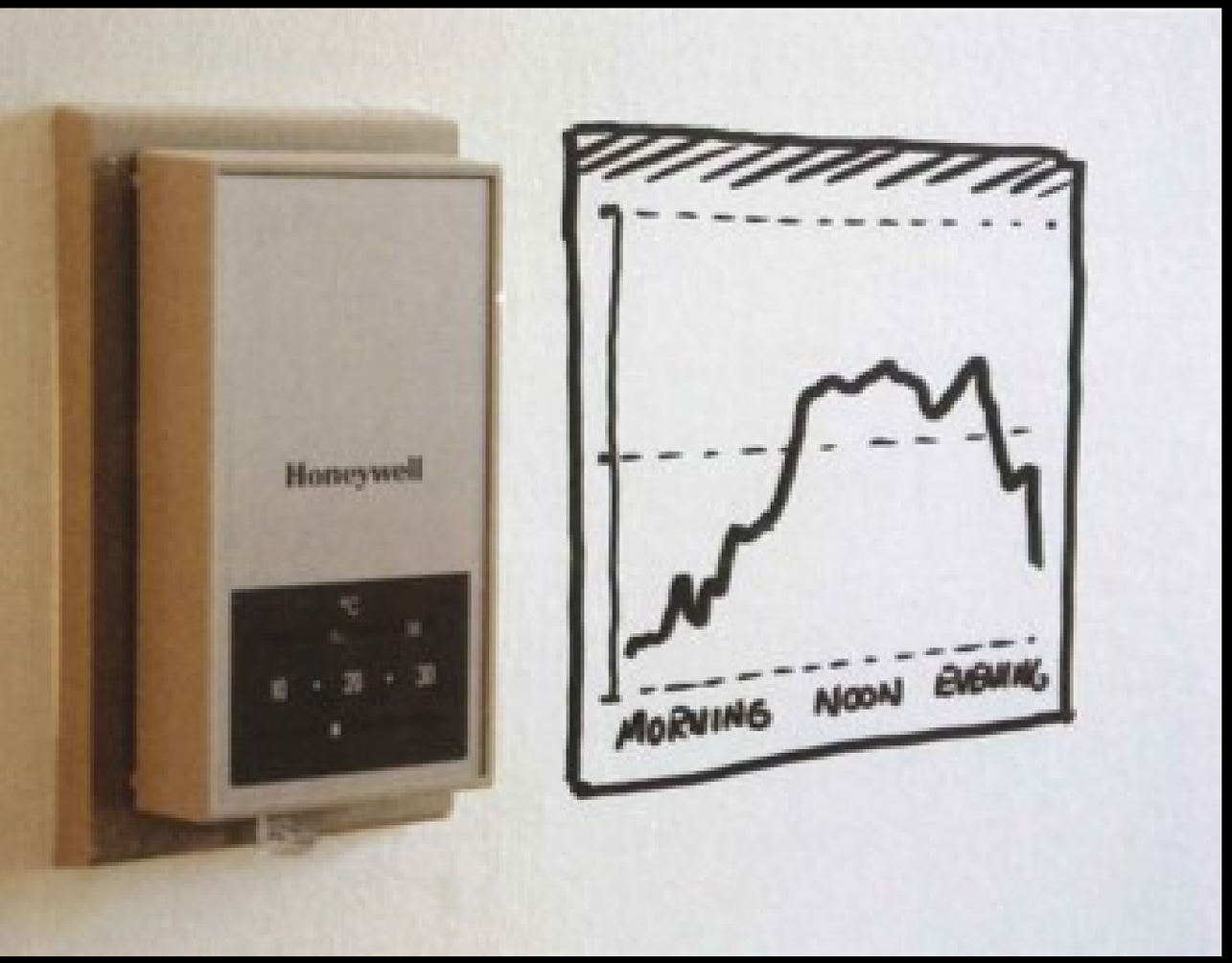
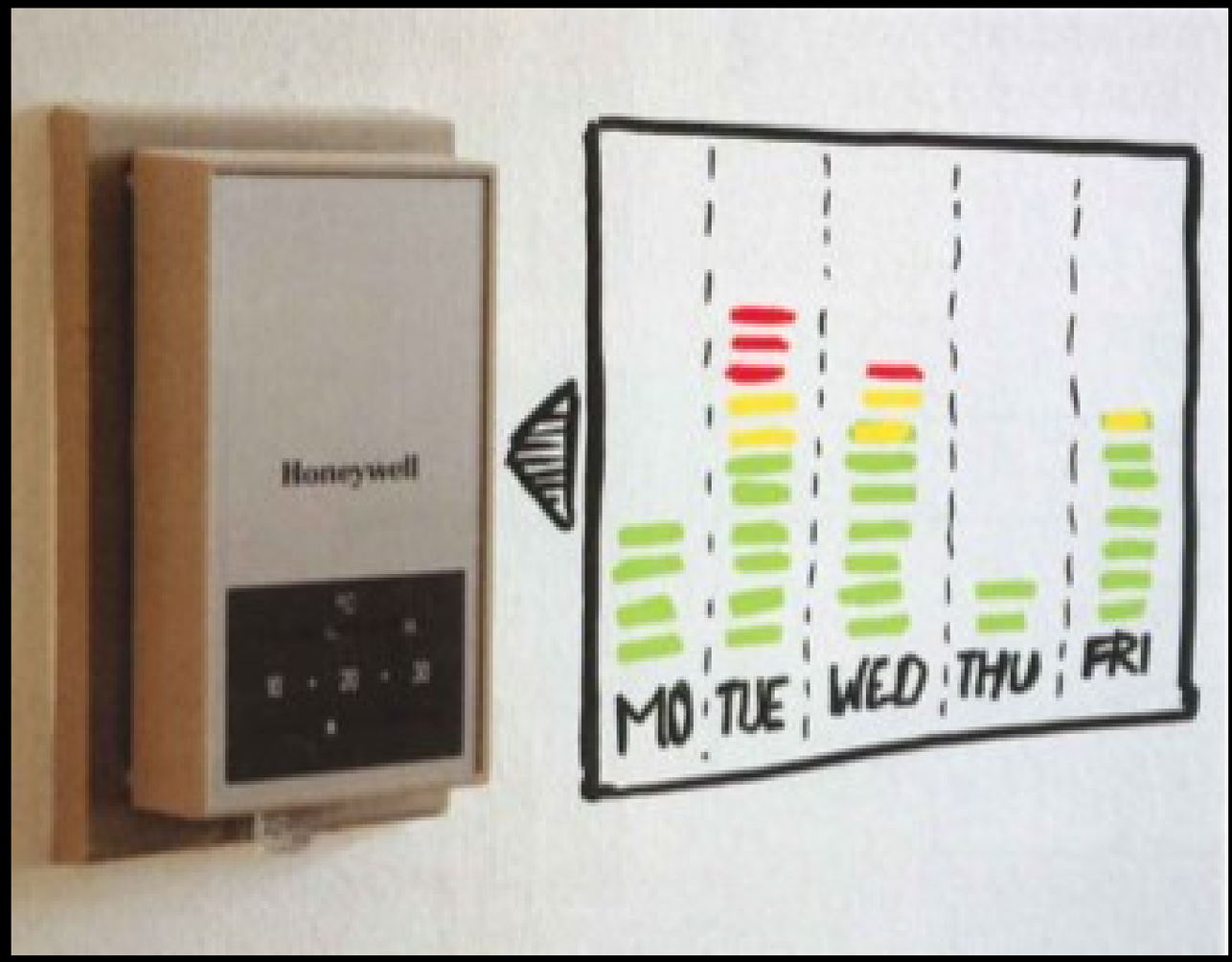
Greenberg et al. [2]

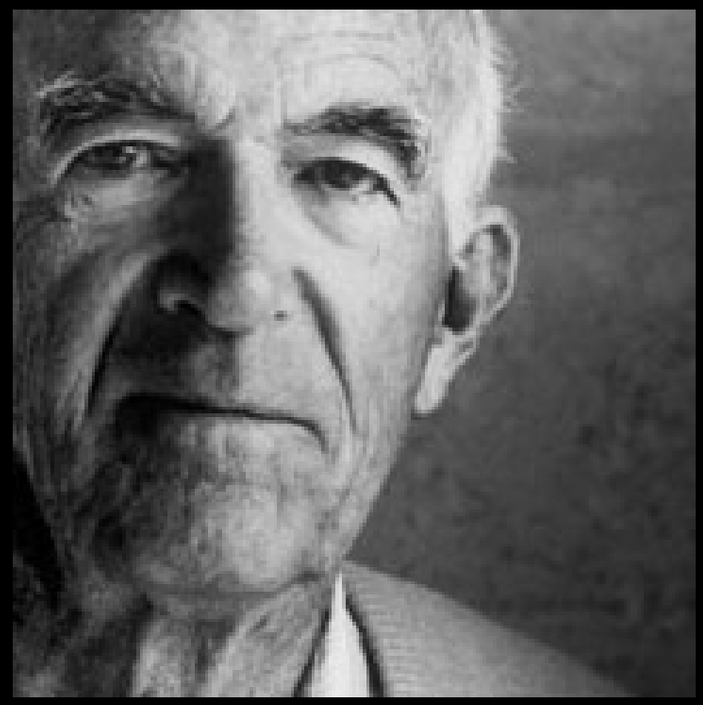
Sketching Shortcuts: **Hybrid Sketches**

Greenberg et al. [2]

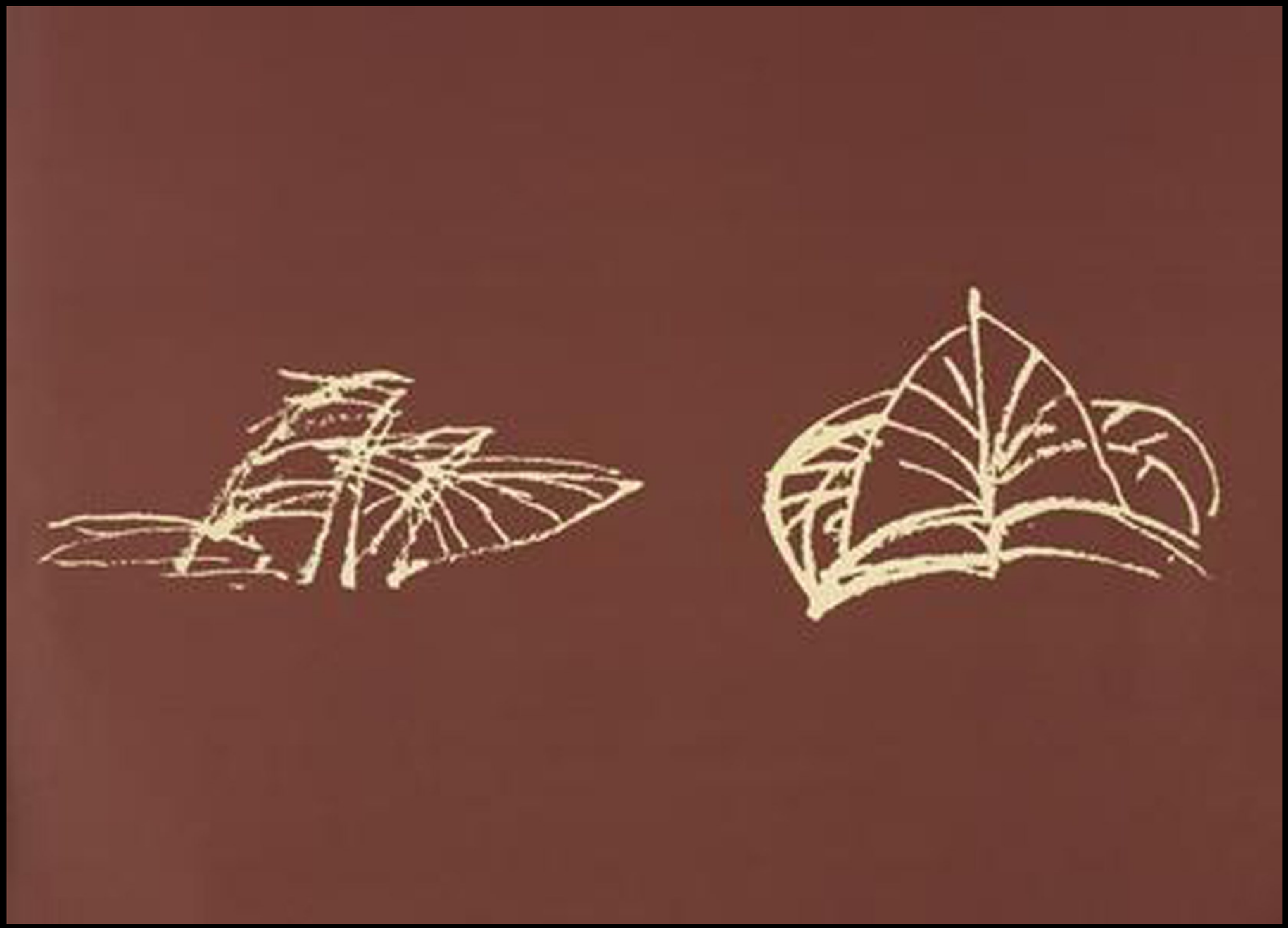




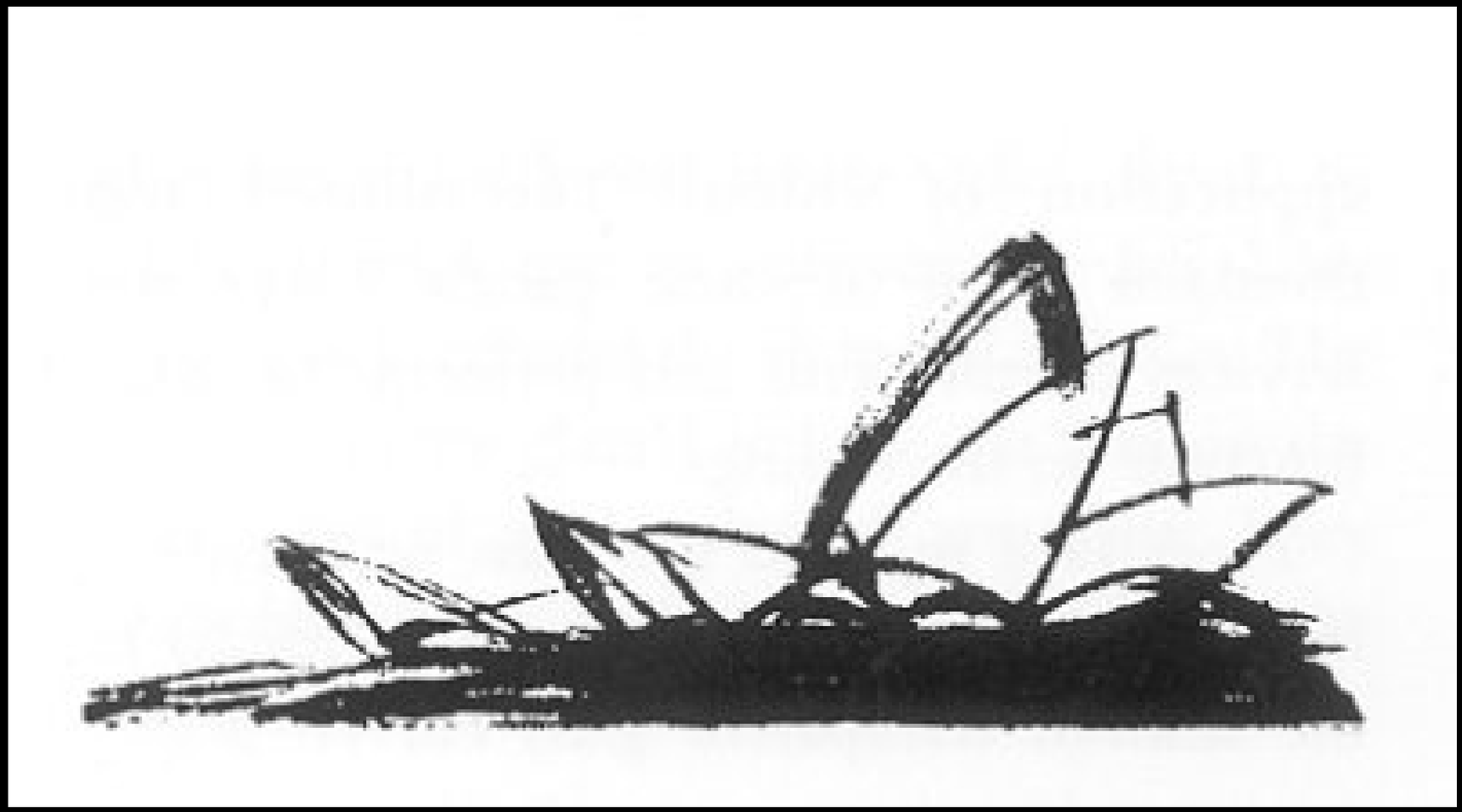
Greenberg et al. [2]



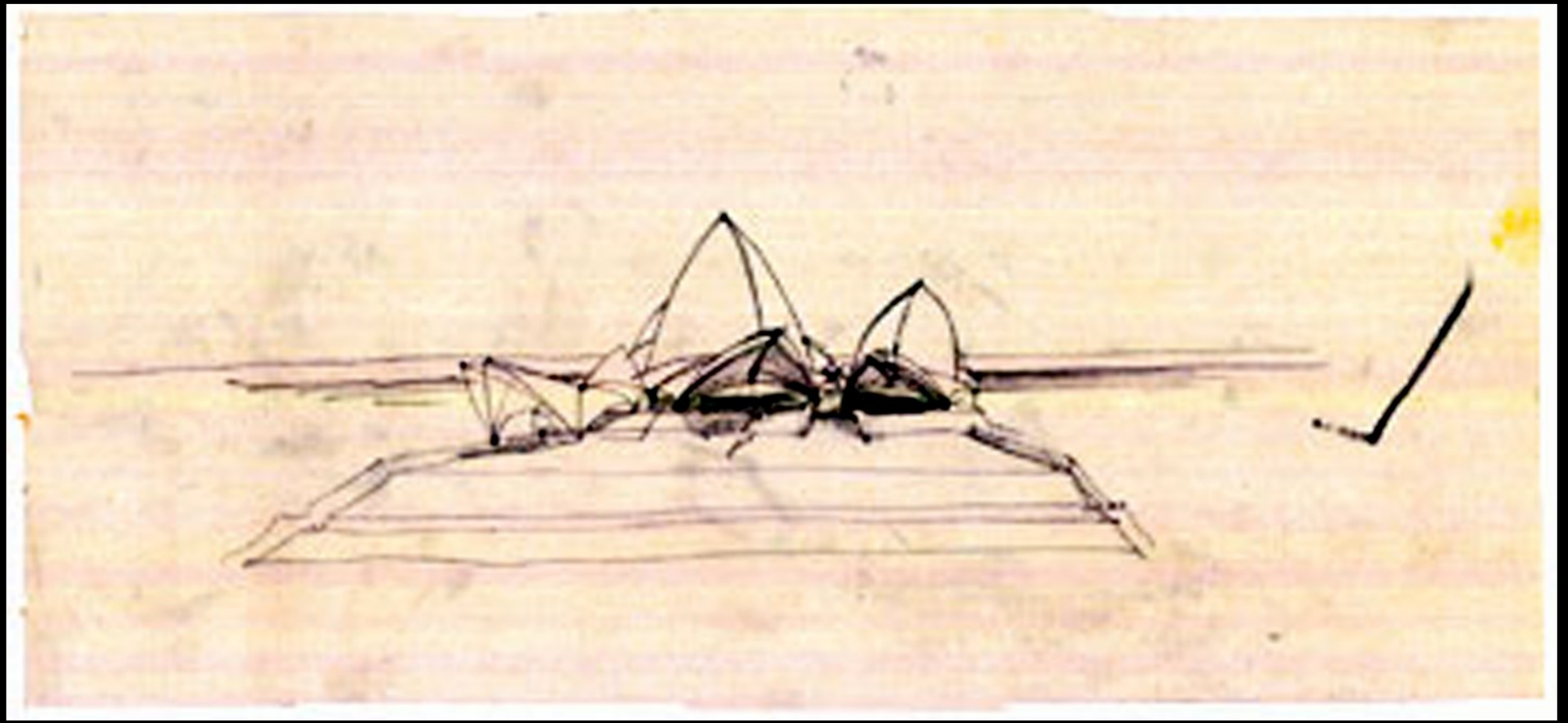
Jørn Utzon | Architect



Source: Jørn Utzon



Source: Jørn Utzon



Source: Jørn Utzon

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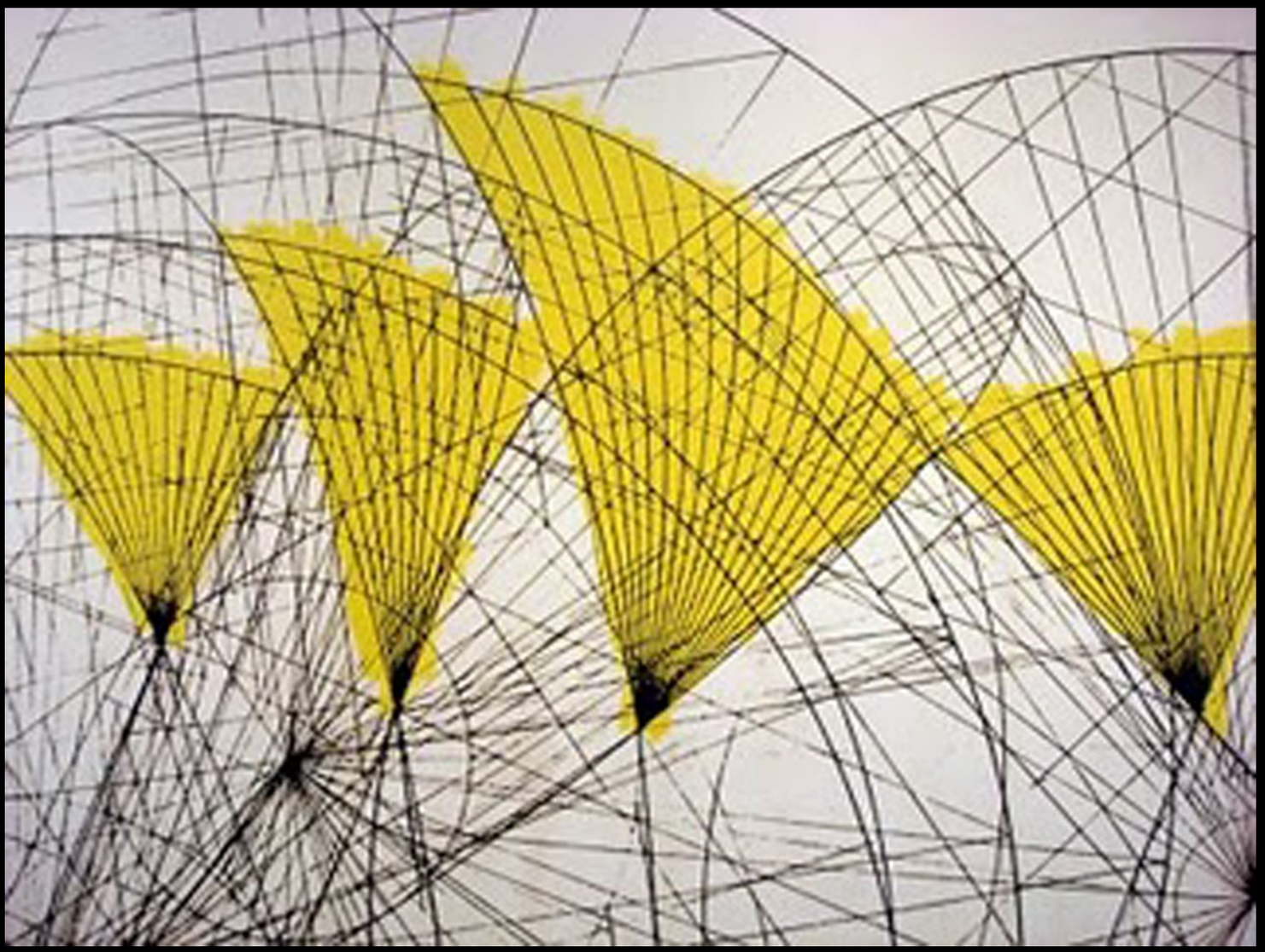
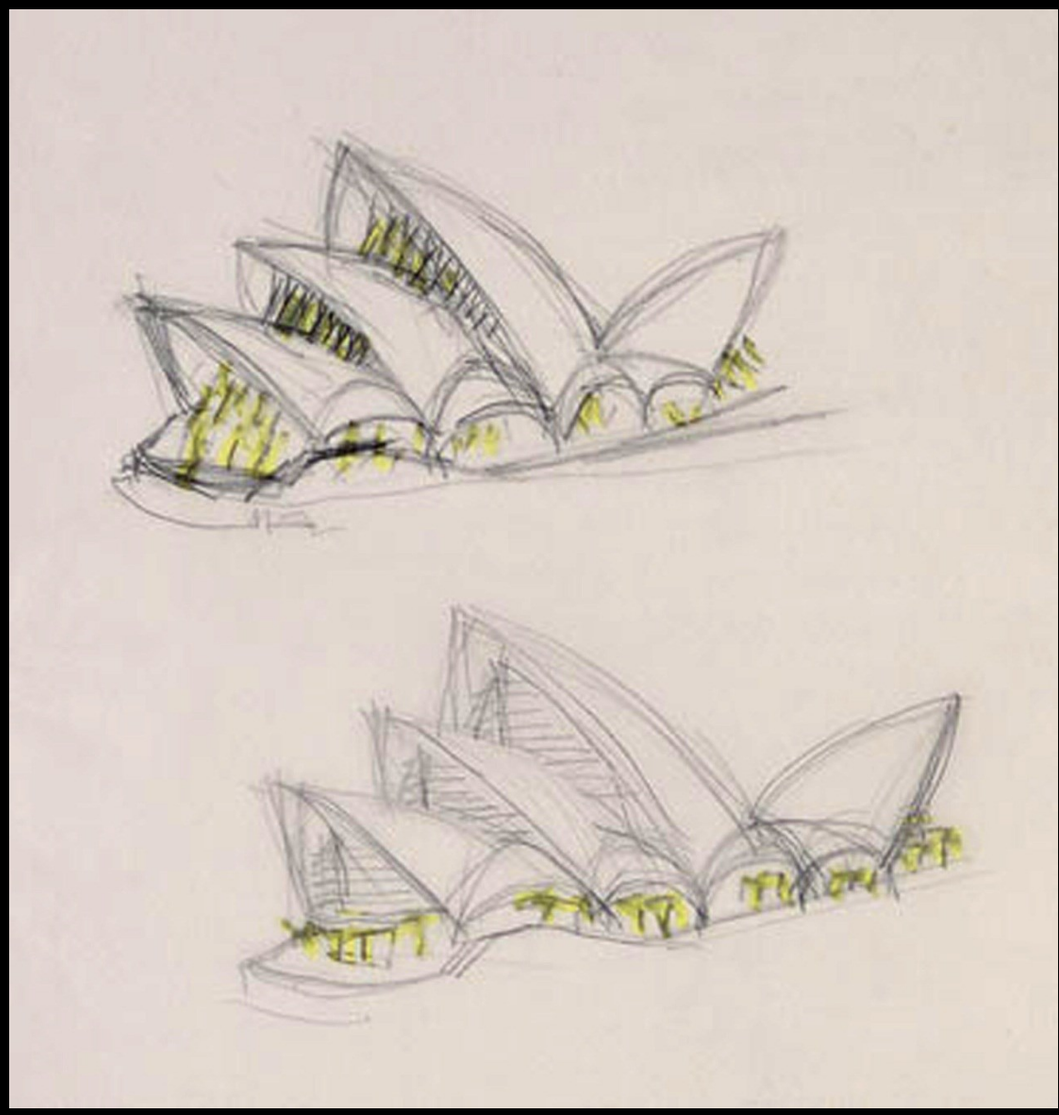


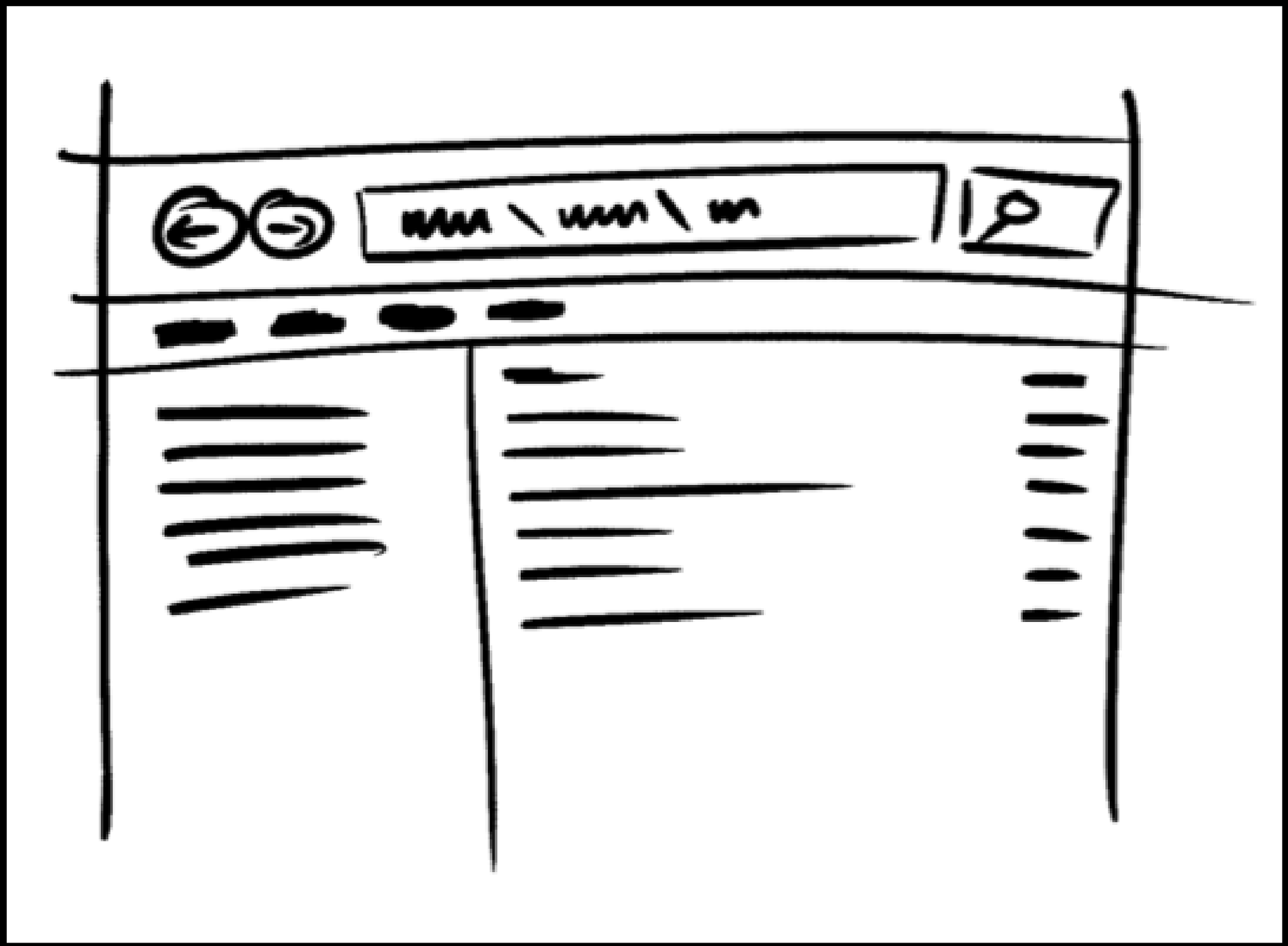


Source: Jørn Utzon

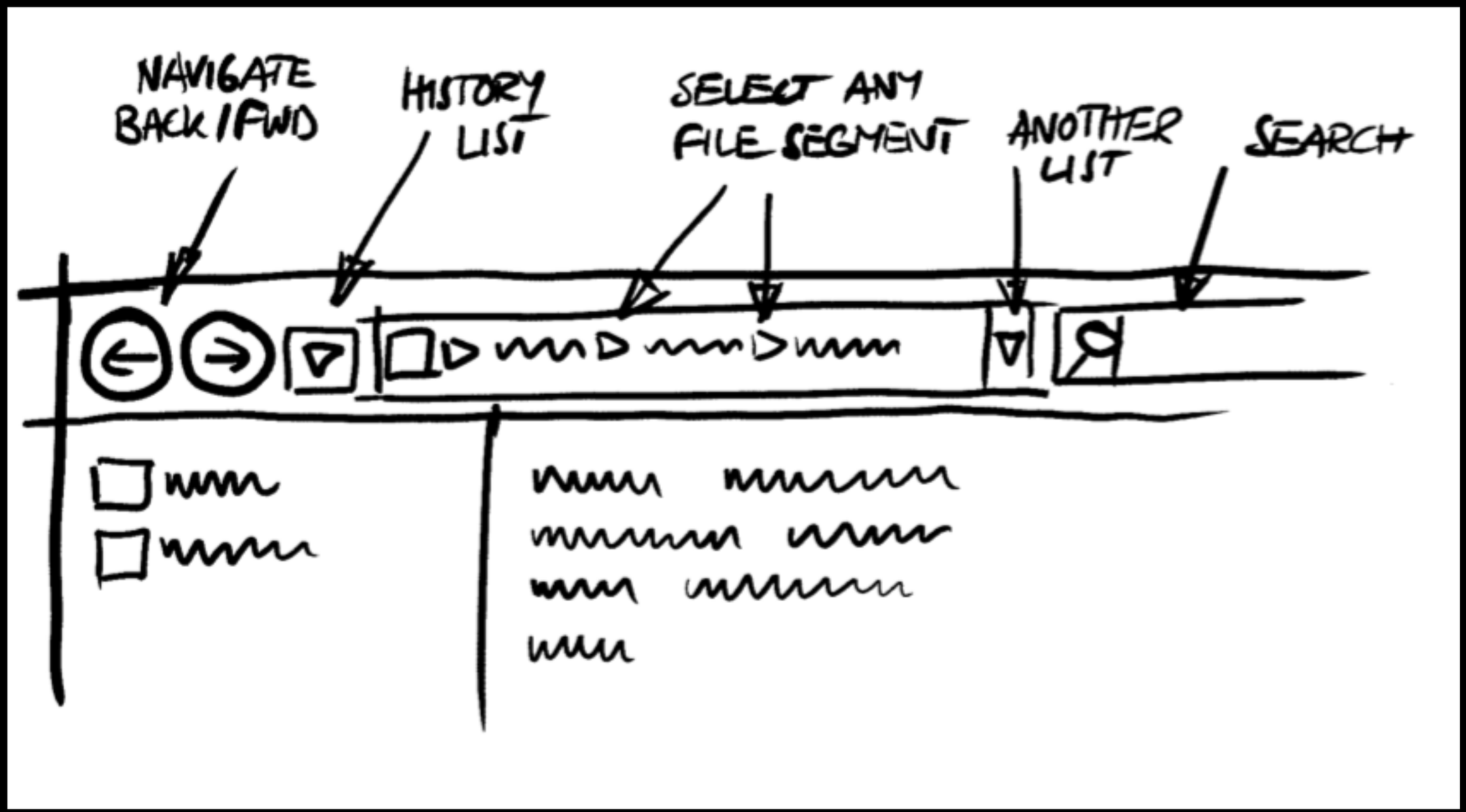
Minimal detail and distinct gesture

Technique: **Reduce to essentials**

Technique: **Reduce to essentials**

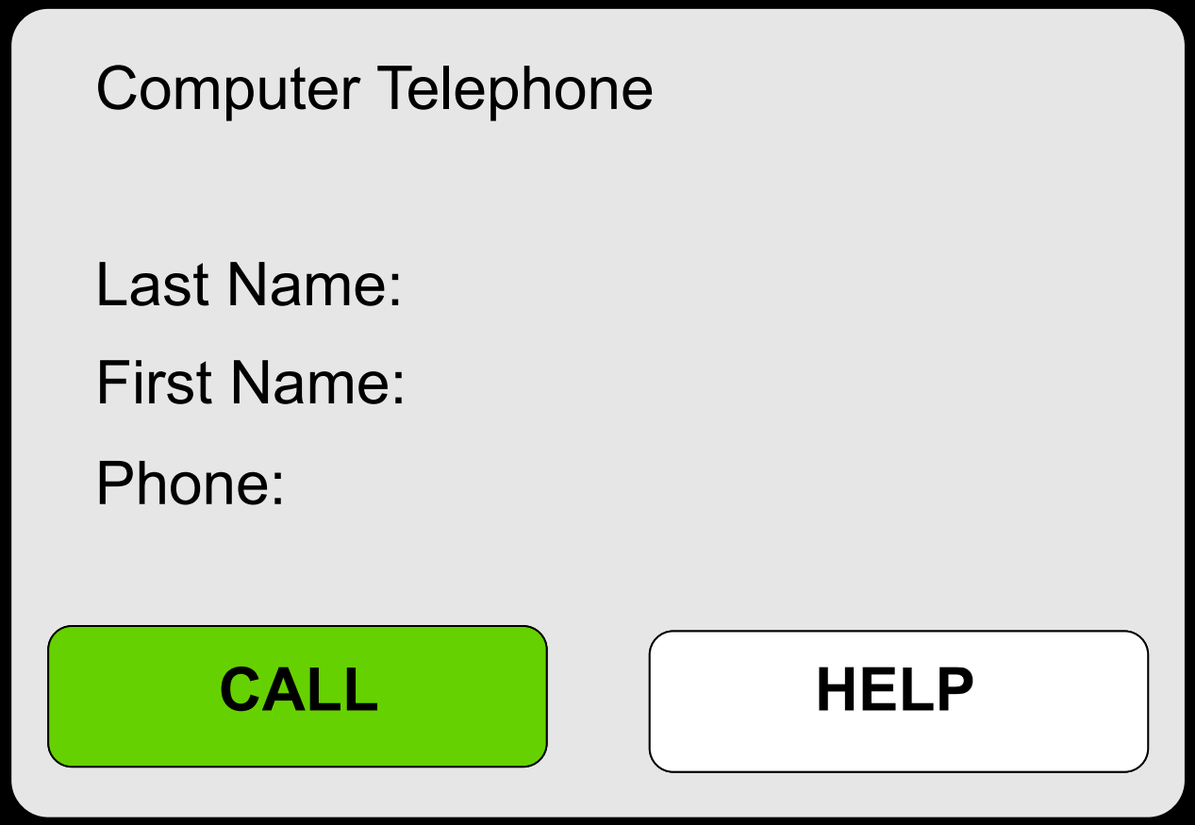


Greenberg et al. [2]



Greenberg et al. [2]

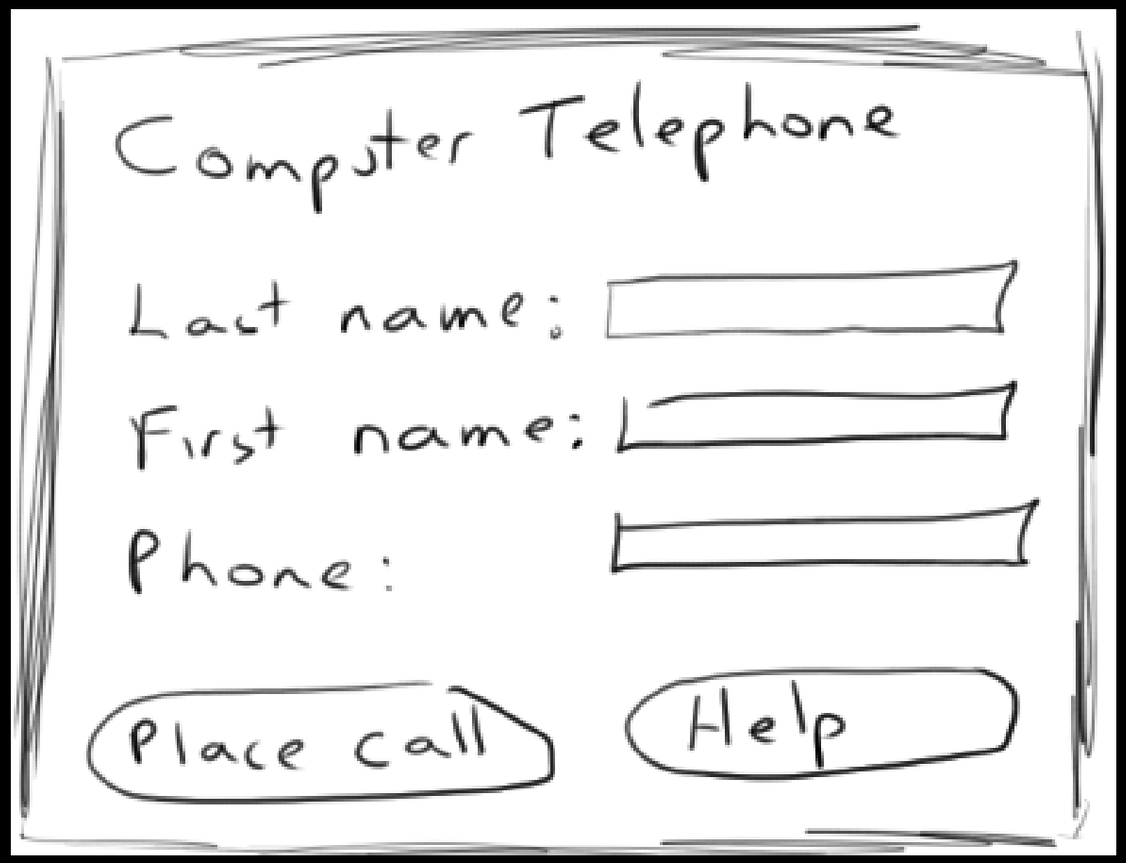
Technique: **Reduce to essentials**



Low Fidelity ⟷ **High Fidelity**

Greenberg et al. [2]

Technique: **Reduce to essentials**



Computer Telephone

Last Name:

First Name:

Phone:

CALL **HELP**

Low Fidelity **High Fidelity**

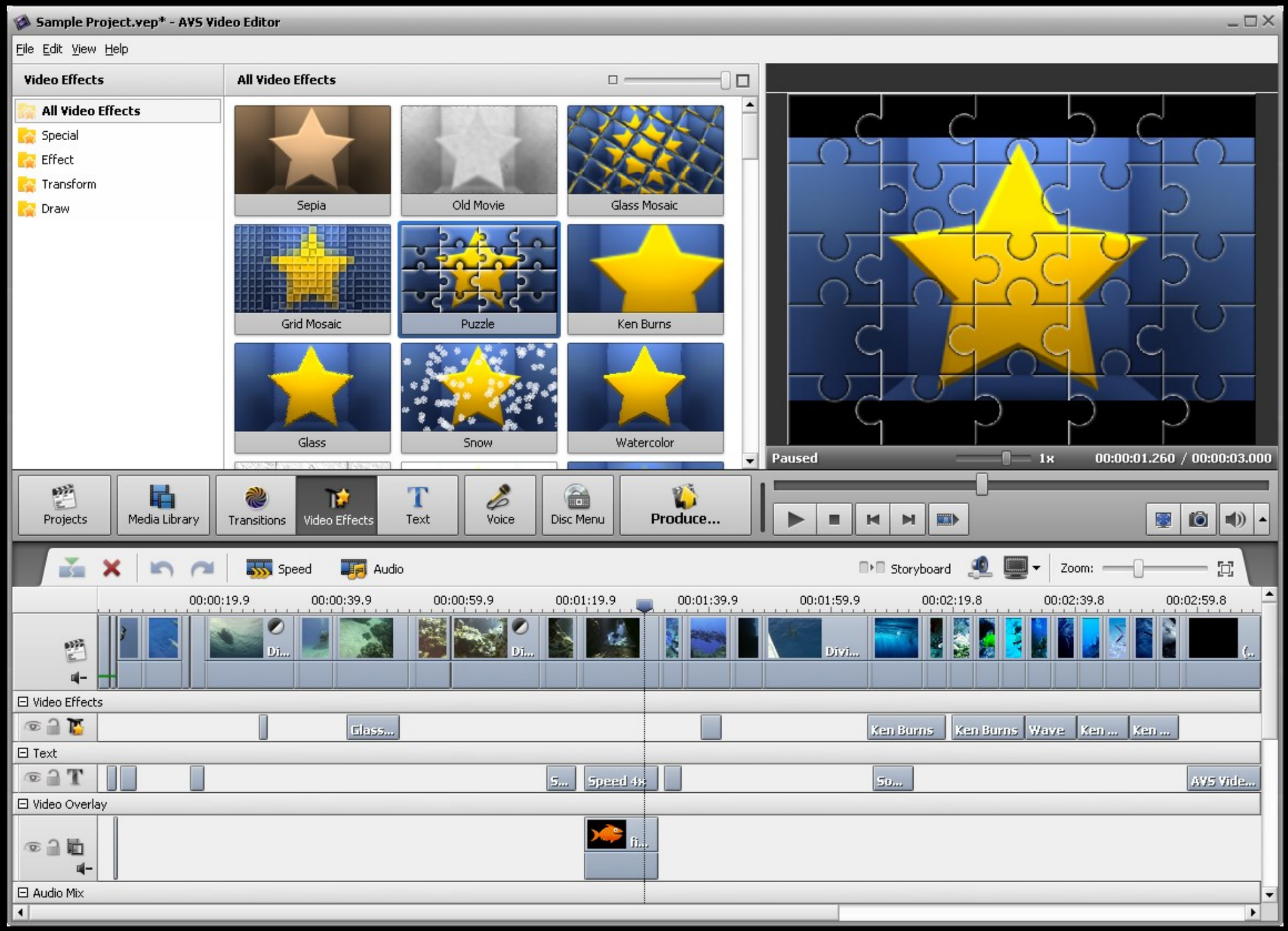
Greenberg et al. [2]

Live sketching:

Simplify to essentials

Task: **Sketch the essential elements of the following interfaces**

Task: **Sketch the essential elements of the following interfaces**



Task: **Sketch the essential elements of the following interfaces**

Task: **Sketch the essential elements of the following interfaces**

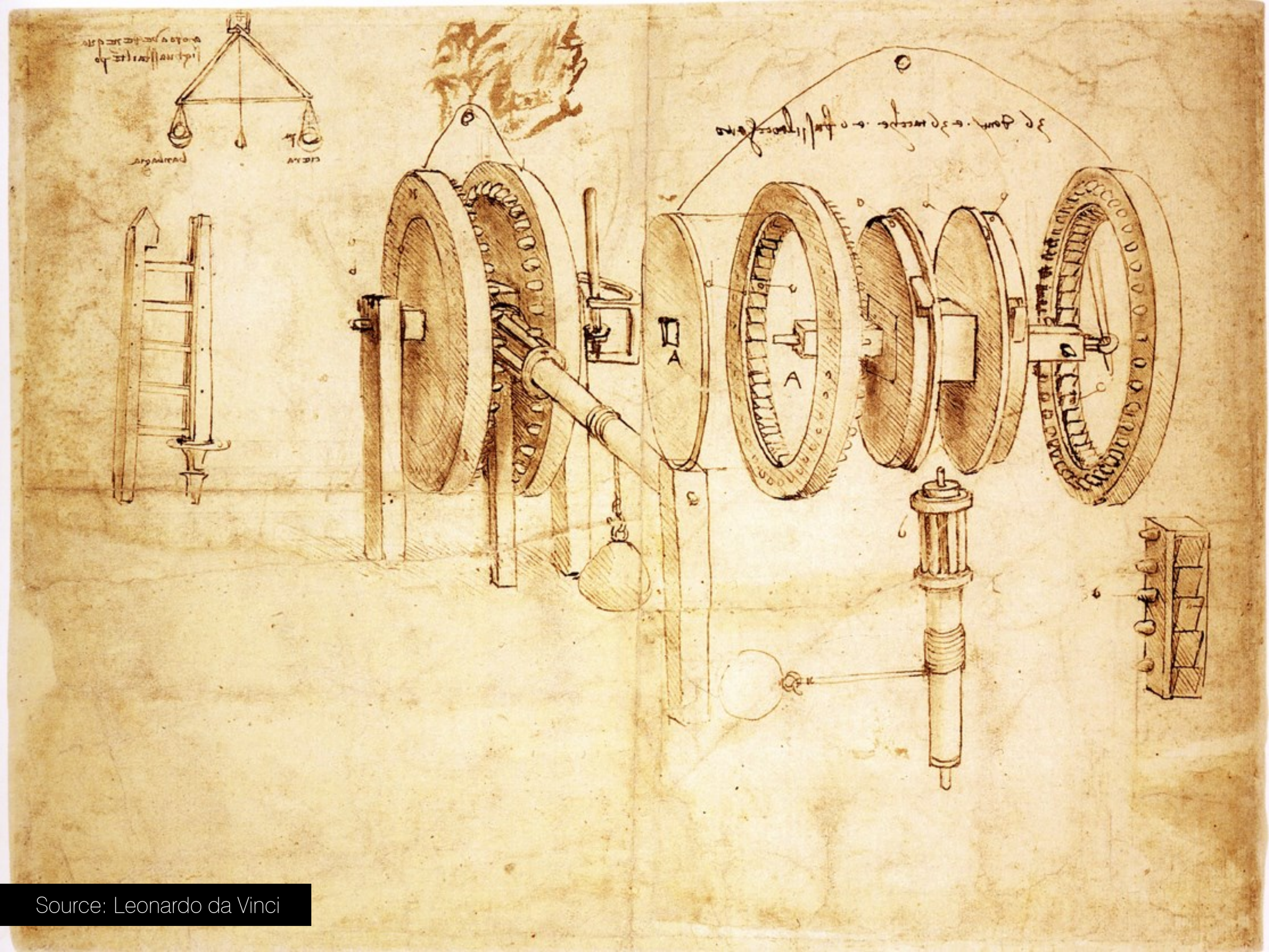
… and now sketch variations of this interface.

8

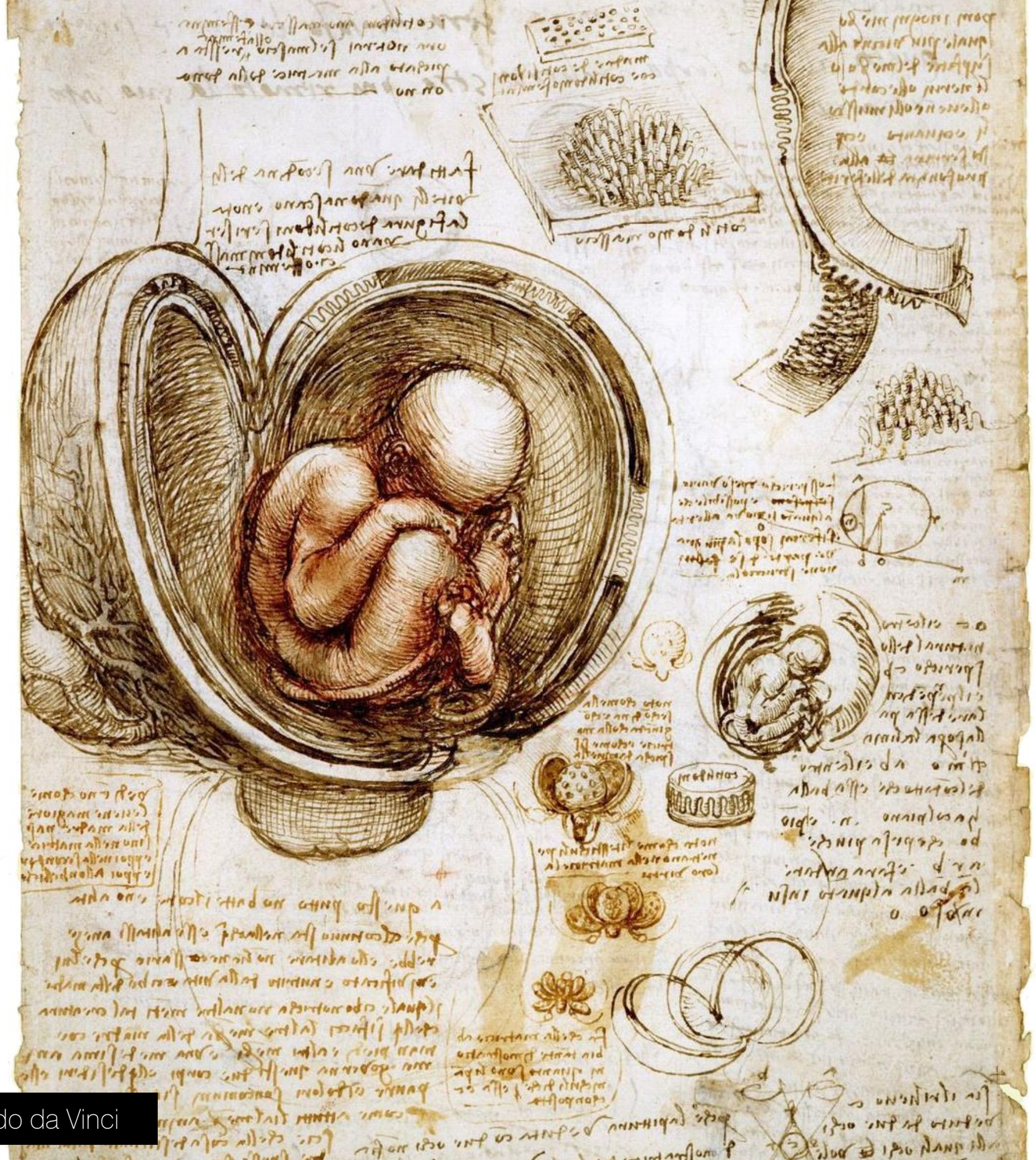
Leonardo da Vinci | Scientist, Artist,...

8

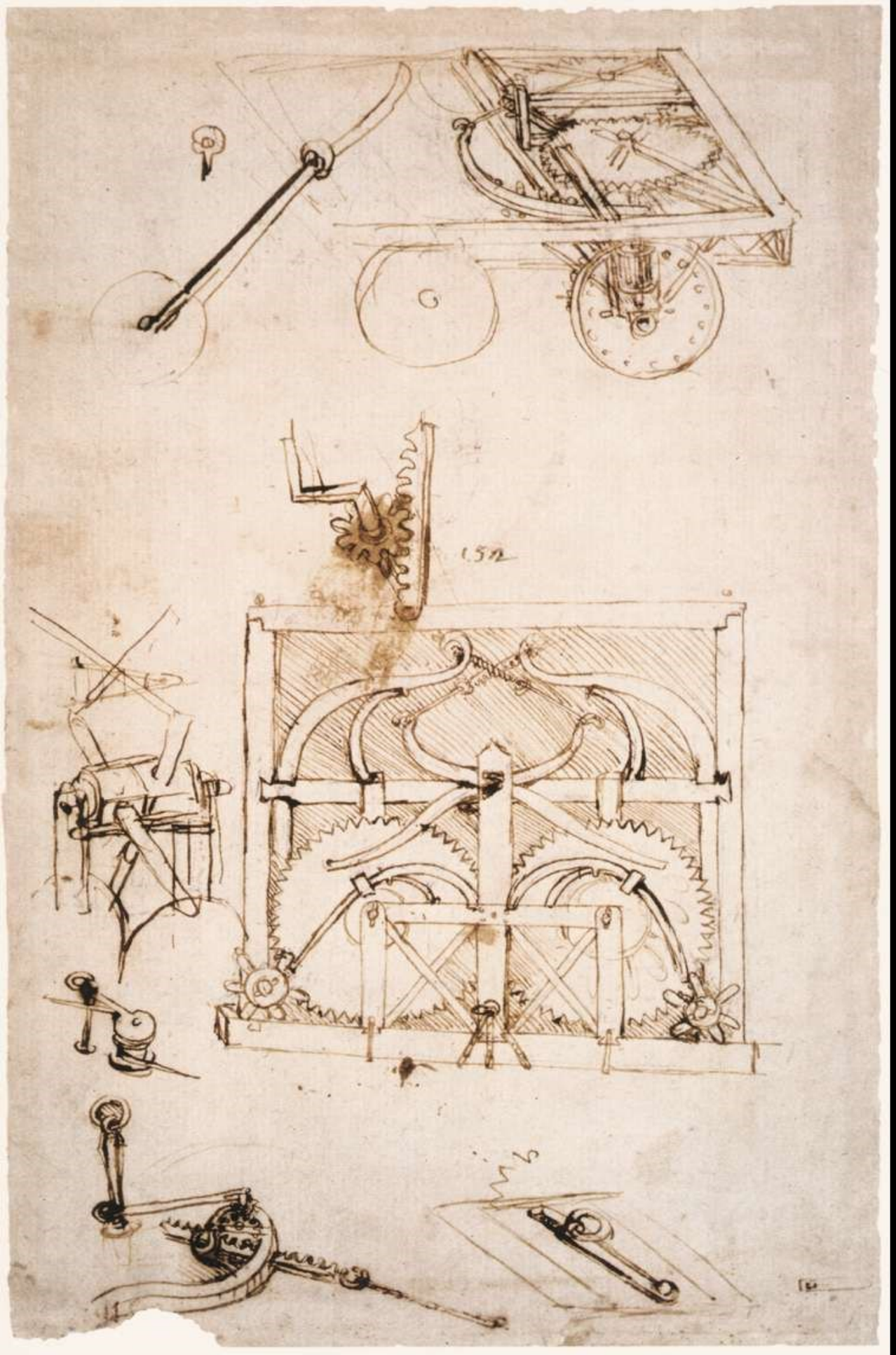
Leonardo da Vinci | Scientist, Artist, Architect, Writer, Sculptor, Musician, Engineer, Mathematician, Inventor, Botanist, Anatomist, Cartographer, …



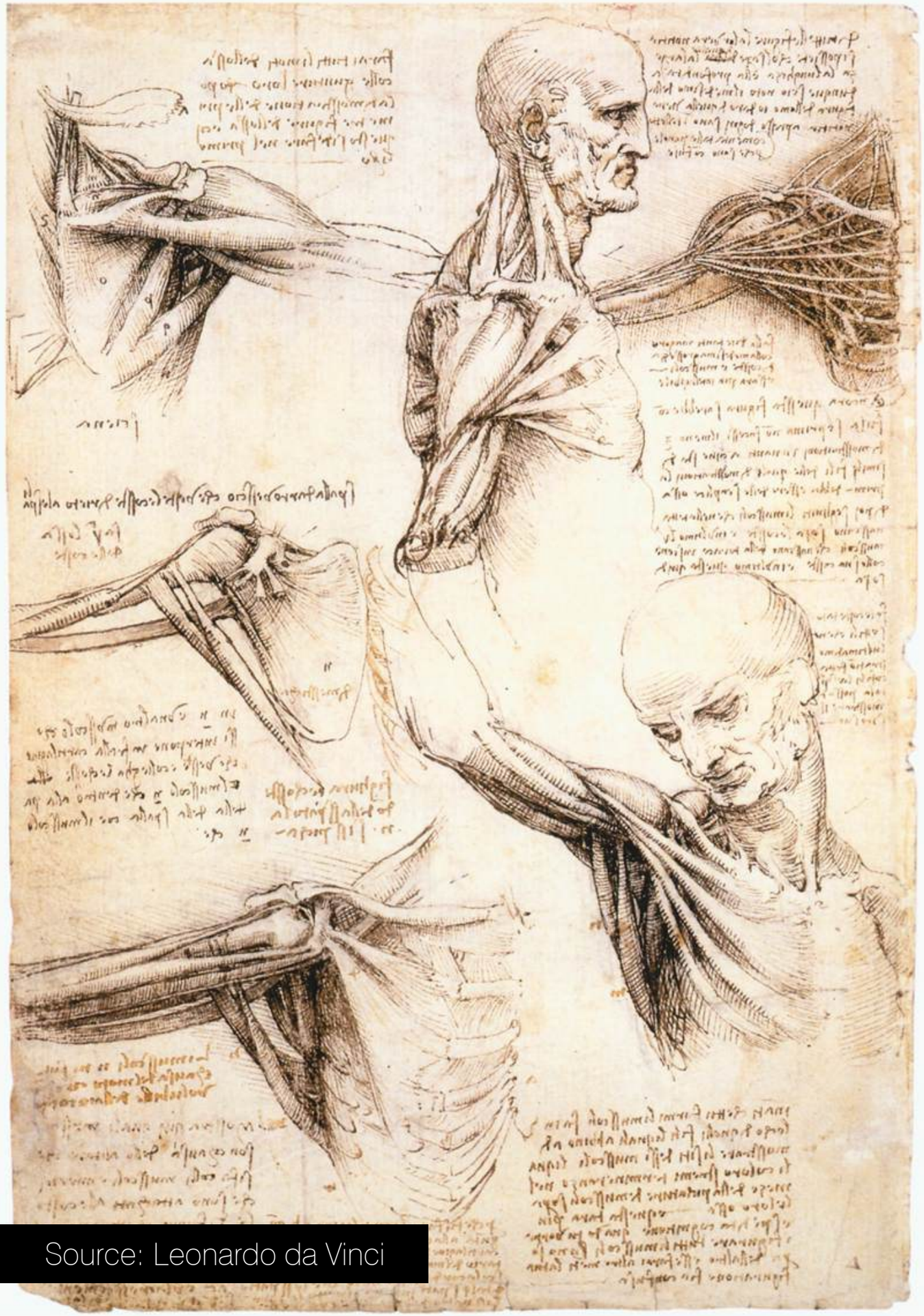
Source: Leonardo da Vinci



Source: Leonardo da Vinci



Source: British Library
http://www.bl.uk/onlinegallery/ttp/ttpbooks.html



Source: Leonardo da Vinci

Source: Leonardo da Vinci

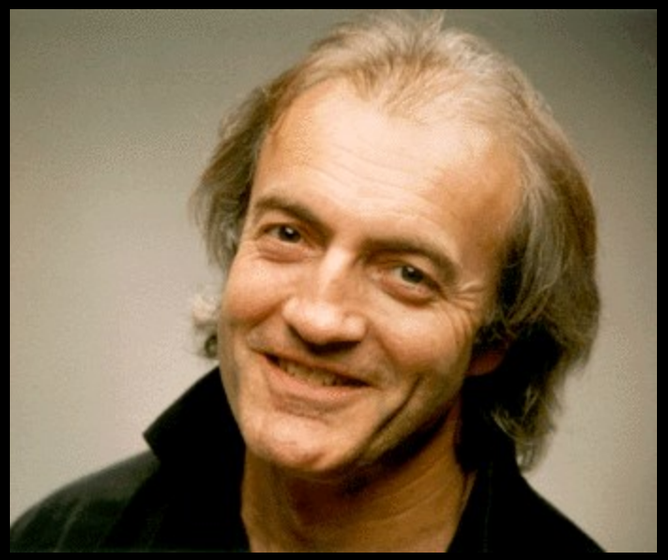
Ambiguous

Walt Disney | Film producer, Director

Visual Narrative: **Storyboards**

Source: Disney and [5]

Appropriate degree of refinement



Visual Narrative: **Storyboards**

Source: Disney and [5]

Visual Narrative: **Storyboards**

Problem with **single sketches**

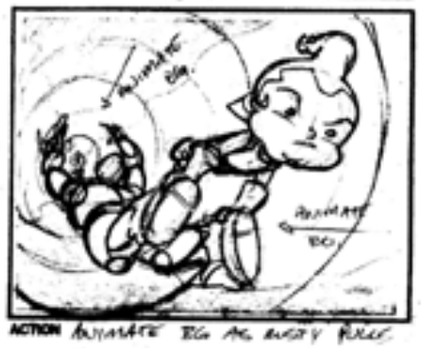
- hard to capture dynamics of interaction over time
- captures user interface, not user behavior

A good sketch should **tell a story**

BIG GUY

PROD # 126 | ACT 1

SC | PNL 1



ACTION ANIMATE BG AS RUSTY RUNS. SYNTH-DWAYNE THROWN EXIT TUBE BY HIS FEET.

DIAL

TIMING

SC | PNL 2

ON SYNTH-DWAYNE.

SC | PNL 2

HE SPREADS HIS ARMS OUT. BUTTON HIS PANTS TO THE TRAVICE SIDES.

<SPARKS> FLY.

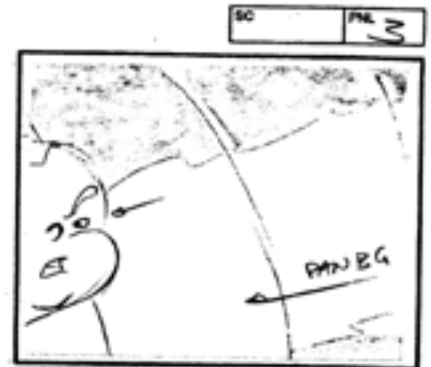
SC | PNL 1

3H ON RUSTY. PAN BG AS HE FLIES.

SC | PNL 2

RUSTY IS THROWN BACK A BIT. HE LOOKS BACK IN SHOCK.

SC | PNL 3



RUSTY IS PULLED BACK SLOWLY

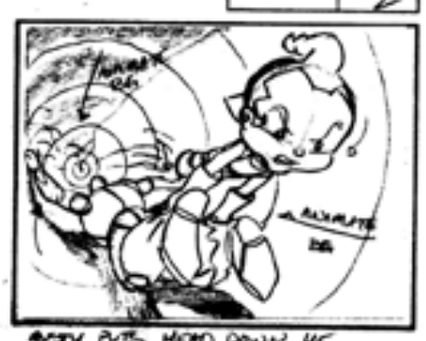
TIMING

SC | PNL 1

ACTION RUSTY PULLS AS SYNTH-DWAYNE THROWS HIM WITH HIS HANDS. SCREECHING ON THE EDGES OF THE TUBE.

DIAL

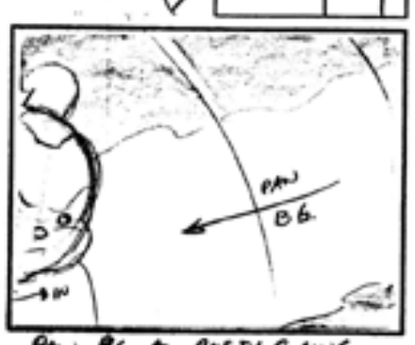
SC | PNL 2



RUSTY PUTS HEAD DOWN. HE STRUGGLES.

RUSTY - OH NO YOU DON'T!

SC | PNL 1



PAN BG AS RUSTY GOING INTO SC.

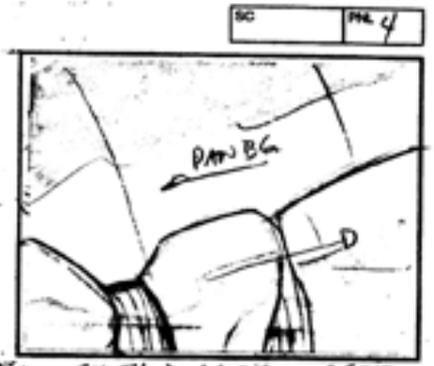
SC | PNL 2

RUSTY CONTINUES AHEAD.

SC | PNL 3

RUSTY FLIES O.S. SYNTH-DWAYNE'S FOOT PULLED INTO SC.

SC | PNL 4



SYNTH-DWAYNE'S HAND SWIPES INTO SC.

TIMING ANIMATING BG. SHOULD BE SLOWER THAN IN FIRST SCENE.

SC | PNL 5

ACTION SYNTH-DWAYNE'S HEAD PULLED INTO SC.

DIAL

SC | PNL 6

S. DWAYNE'S HAND SWIPES ACROSS TUBEWALL, SPARKING

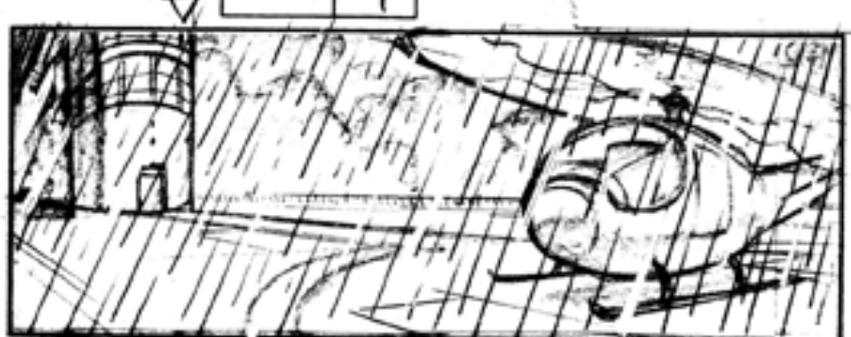
<SPARKS>

SC | PNL 7

S. DWAYNE'S HAND O.S. SPARKS FOLLOW.

TIMING

SC | PNL 1

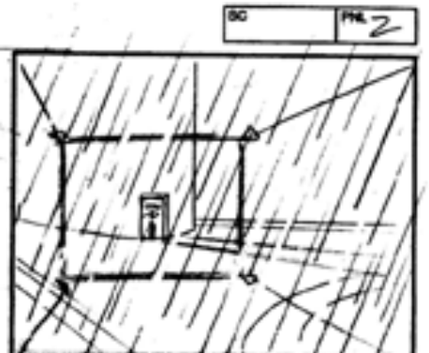


STOP PAN

BG. & HEAD ROTOR HELICOPTER UNITS IN BG, METAL PLANKING STREAM CONTINUES. RAIN FALLS

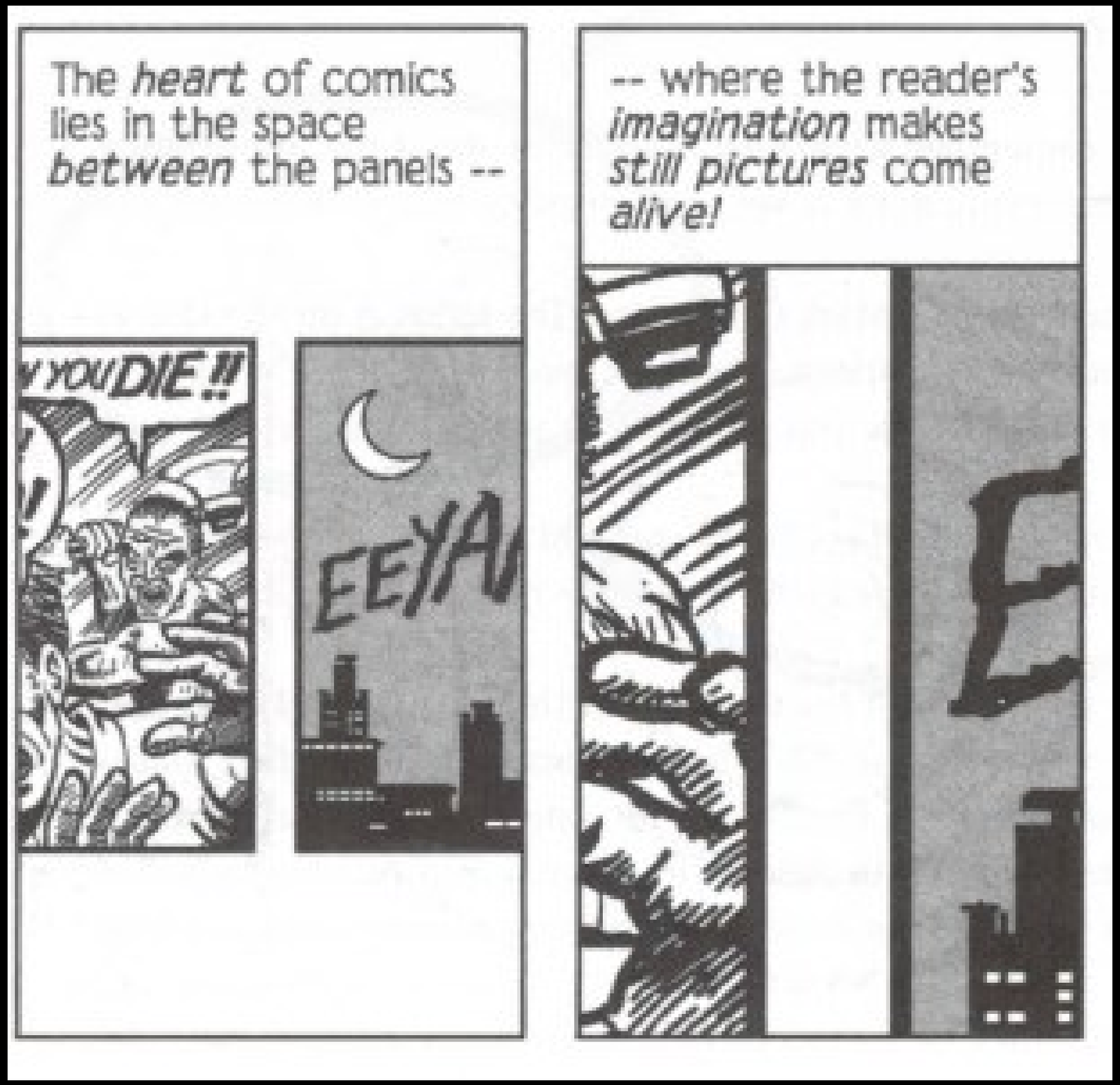
BLADES <WHIRLING>

SC | PNL 2

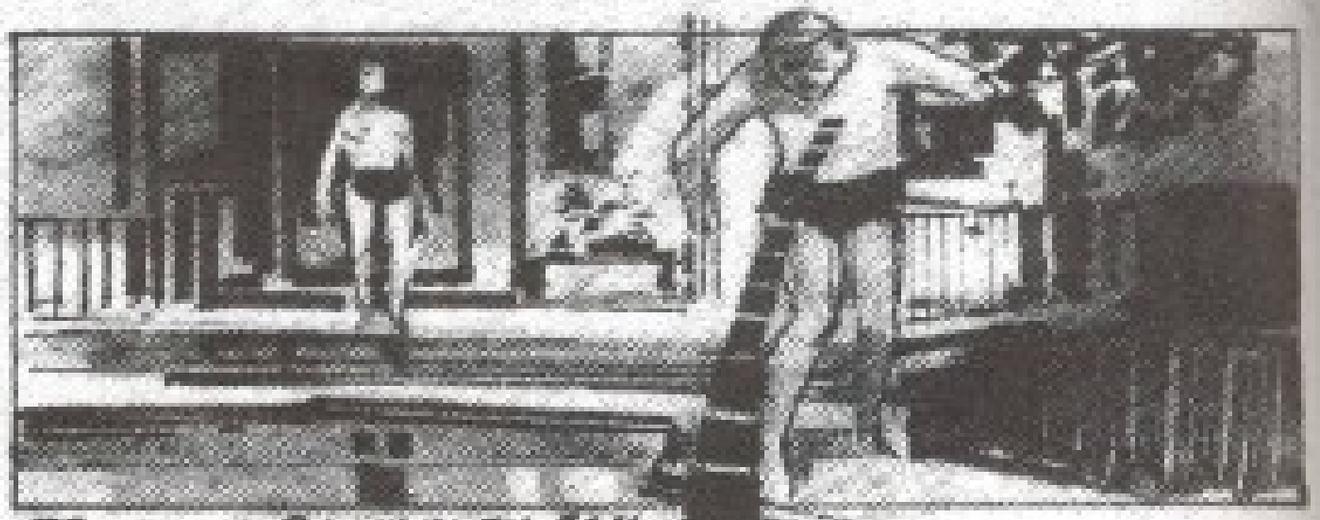


TRUCK IN AS THE SIDE OF DARWIN WITH JOHN ON HIS SHOULDER APPEARS IN DOOR

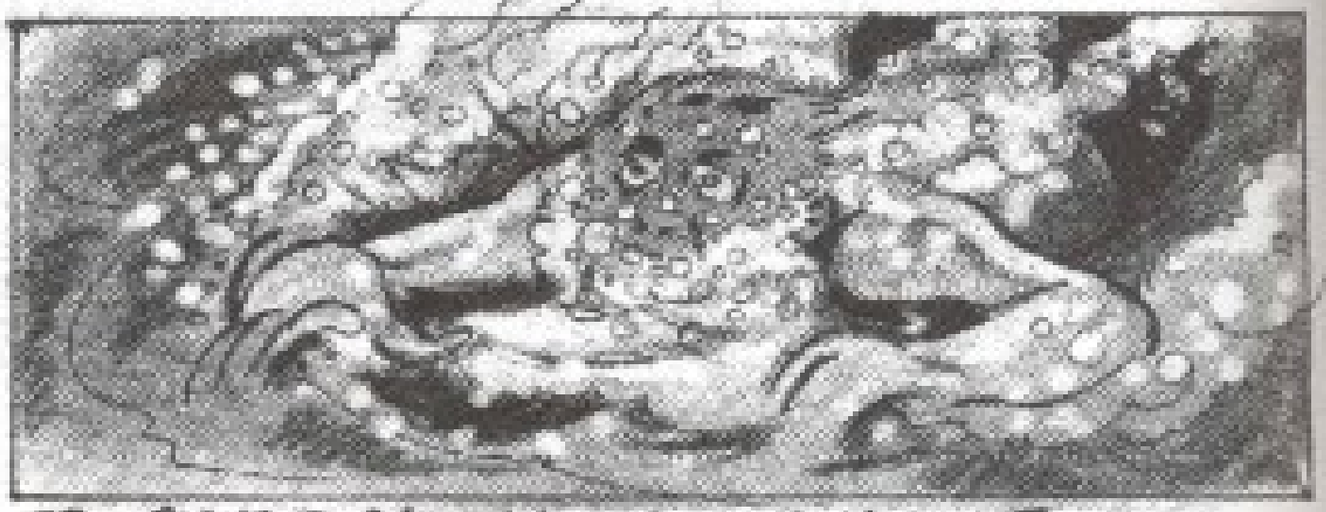
Transitions are key



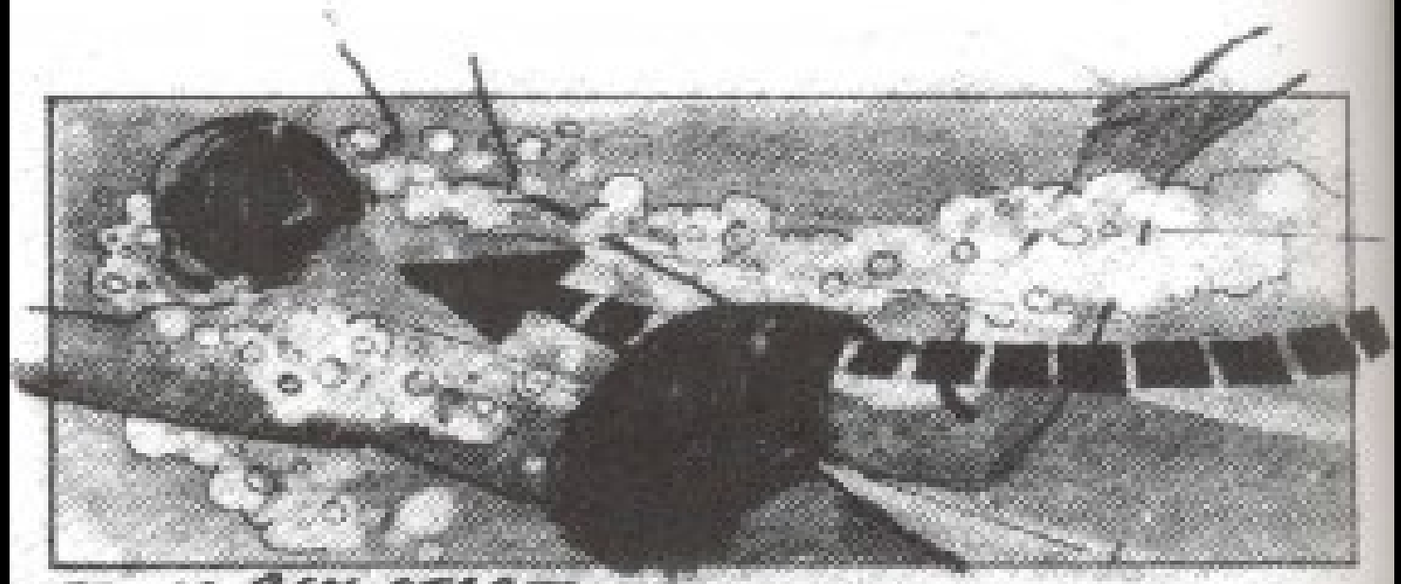
Source: [1] [3]



78 – Leon Jacqe with Ben.

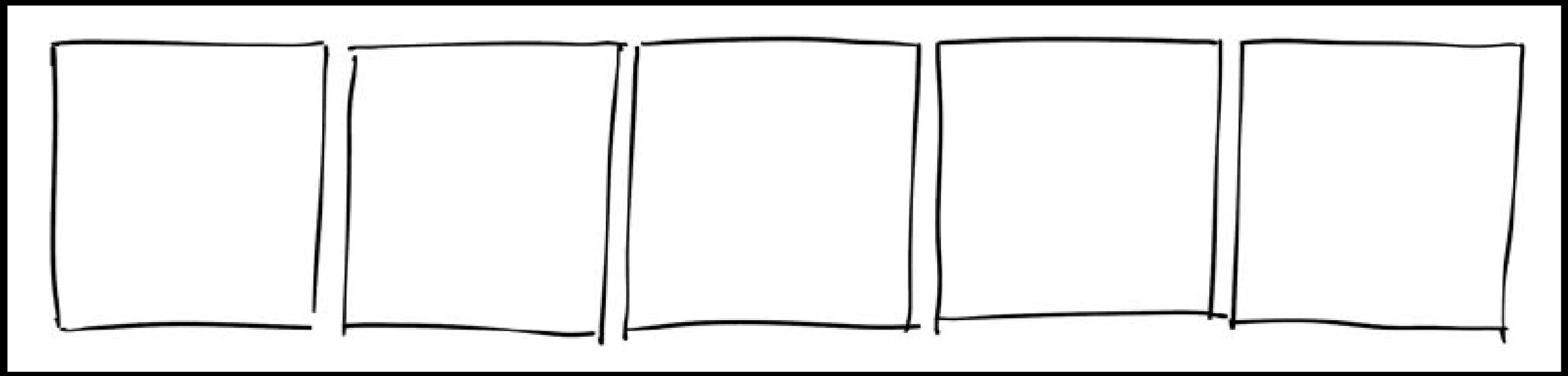


79 – Right to camera and fast pan left



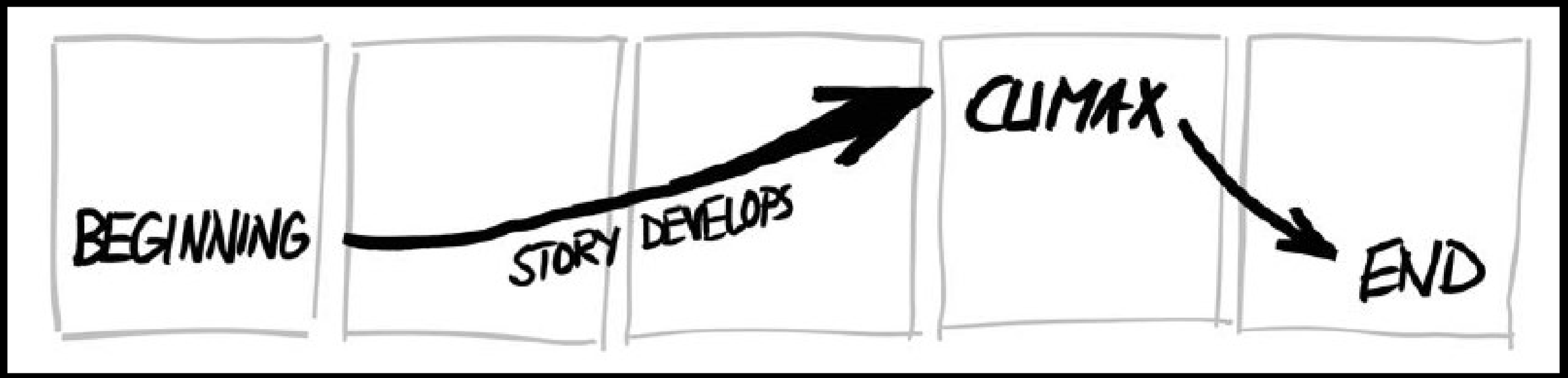
79 – As Ben starts up.

Visual Narrative: **Storyboards**



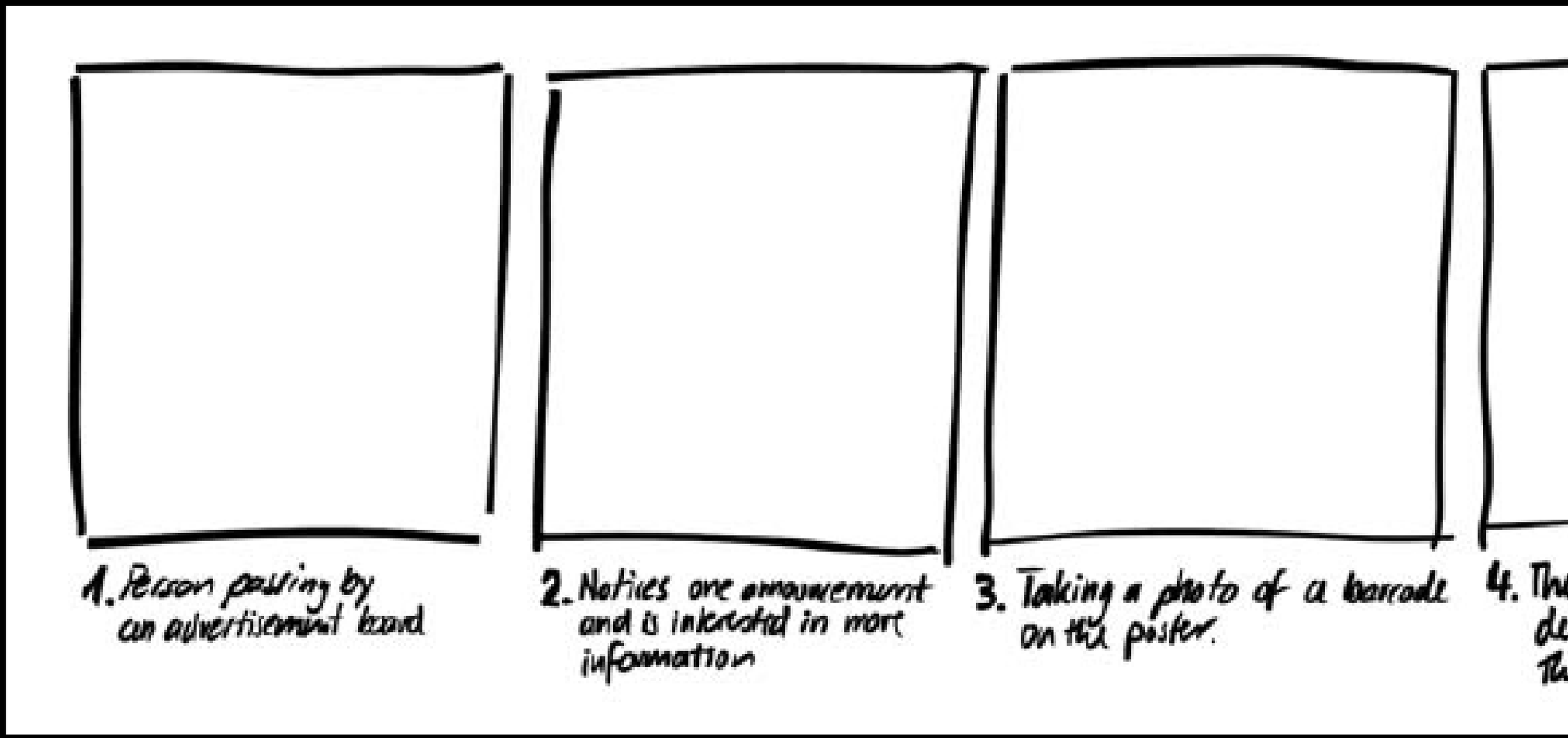
Greenberg et al. [2]

Visual Narrative: **Storyboards**



Greenberg et al. [2]

Visual Narrative: **Storyboards**



Greenberg et al. [2]

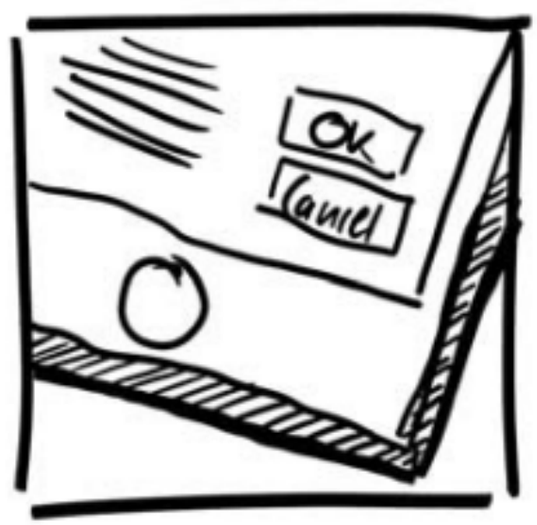
Extreme long shot (wide shot)
A view showing details of the setting, location, etc.

Long shot
Showing the full height of a person.

Medium shot
Shows a person's head and shoulders.

Over-the-shoulder shot
Looking over the shoulder of a person.

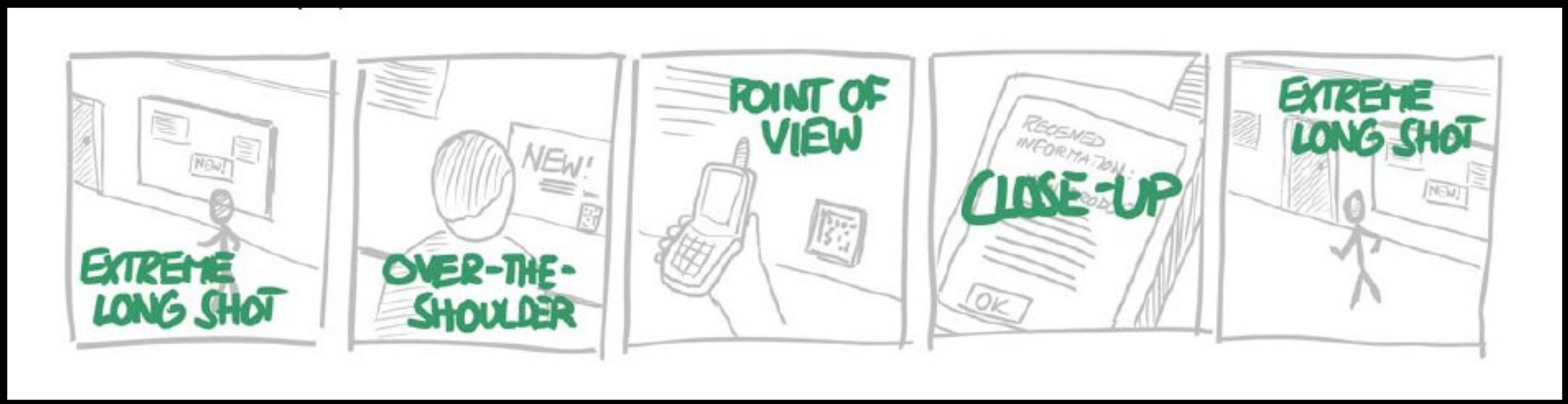
Point of view shot (POV)
Seeing everything that a person sees themselves.



Close-up
such as showing details of a user interface a device the person is holding.

Greenberg et al. [2]

Visual Narrative: **Storyboards**



Greenberg et al. [2]

Visual Narrative: **Storyboards**

Greenberg et al. [2]

Greenberg et al. [2]

Live sketching:

visual narrative & storyboards

HOME 2

Things

Things

Things

NEXT LIST

Next

Filter by Tag

Next

Family

New To Do

TAB-BAR SOLUTION

Next

To Dos

Projects

EDIT MODE

Due Date

Move to

Tags

Notes

Due Date

DUE DATE

Due Date

Remove due date

Reminder

Due Date

Reminder

7 days before

Reminder

days before

Due Date

Due Date

Due Date

SCHEDULED

Scheduled

Simple Things

Scheduled For

Scheduled

New

MANAGING TAGS

Tags

Tags

New Tag

Office

Parent tag

KEYBOARD

KEYBOARD

EDIT / NEW

New

Source: www.culturedcode.com

Source: www.culturedcode.com

Clear vocabulary

Plentiful

Suggest and explore rather than confirm

Quick and inexpensive

Timely, when needed

Disposable

Minimal detail and distinct gesture

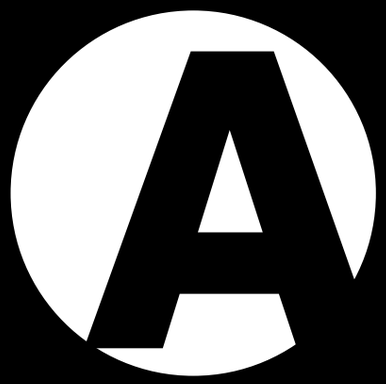
Ambiguous

Appropriate degree of refinement


Cambridge 2008/1

The Sketchbook

- capture many initial ideas
- **explore & refine** ideas both in the large and in the small
- **develop variations**, alternatives, details
- **keep a record** of your ideas
- **reflect** on changing thought processes over time
- **communicate ideas** to others by showing
- **choose** ones worth developing
- capture good ideas you **see elsewhere**
- **collect** photos, tape them into your book

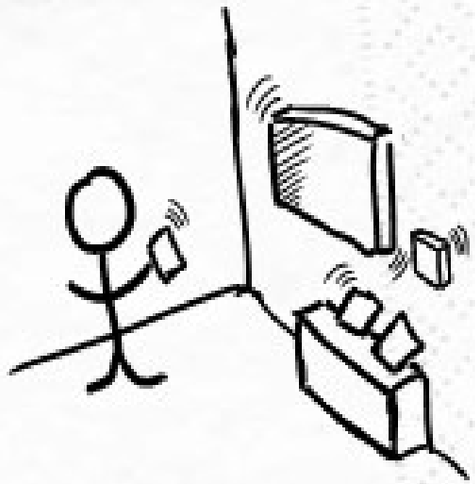


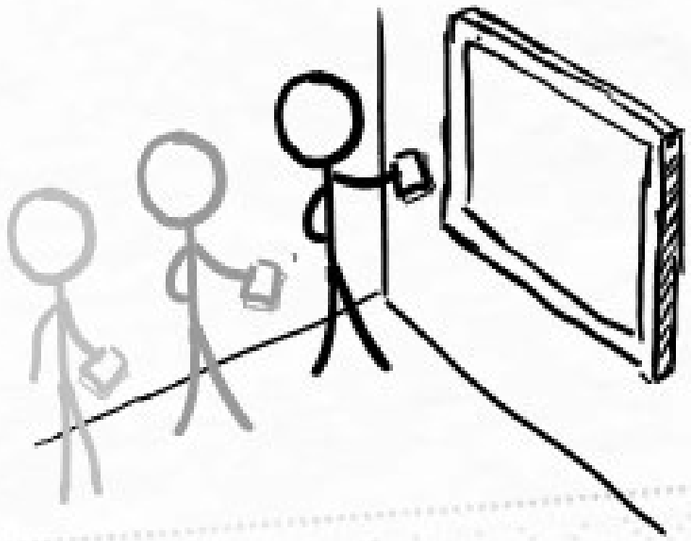
Proxemic Interactions

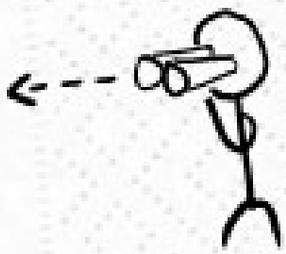
[ITS 2010, ITS 2012, UIST 2011, UIST 2012, IEEE Pervasive]

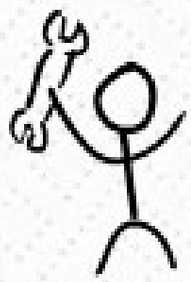

iLab
UNIVERSITY OF CALGARY
MO SHEOL E TOGAM SUAS
Sharpie
Liquid Pen

COMMUNICATE
INTERACT
ENGAGE
SPATIAL RELATIONSHIPS
OBSERVE
VS.
SURFACES
DEVICES
UBIQUITOUS COMPUTING ECOLOGIES
PROXEMICS
DISTANCE
ORIENTATION
MOVEMENT
IDENTITY
HELLO
PROXEMIC INTERACTION
EVALUATE
DESIGN & DEVELOP
iLab
UNIVERSITY OF CALGARY
NICOLAI MARQUARDT









COMMUNICATE
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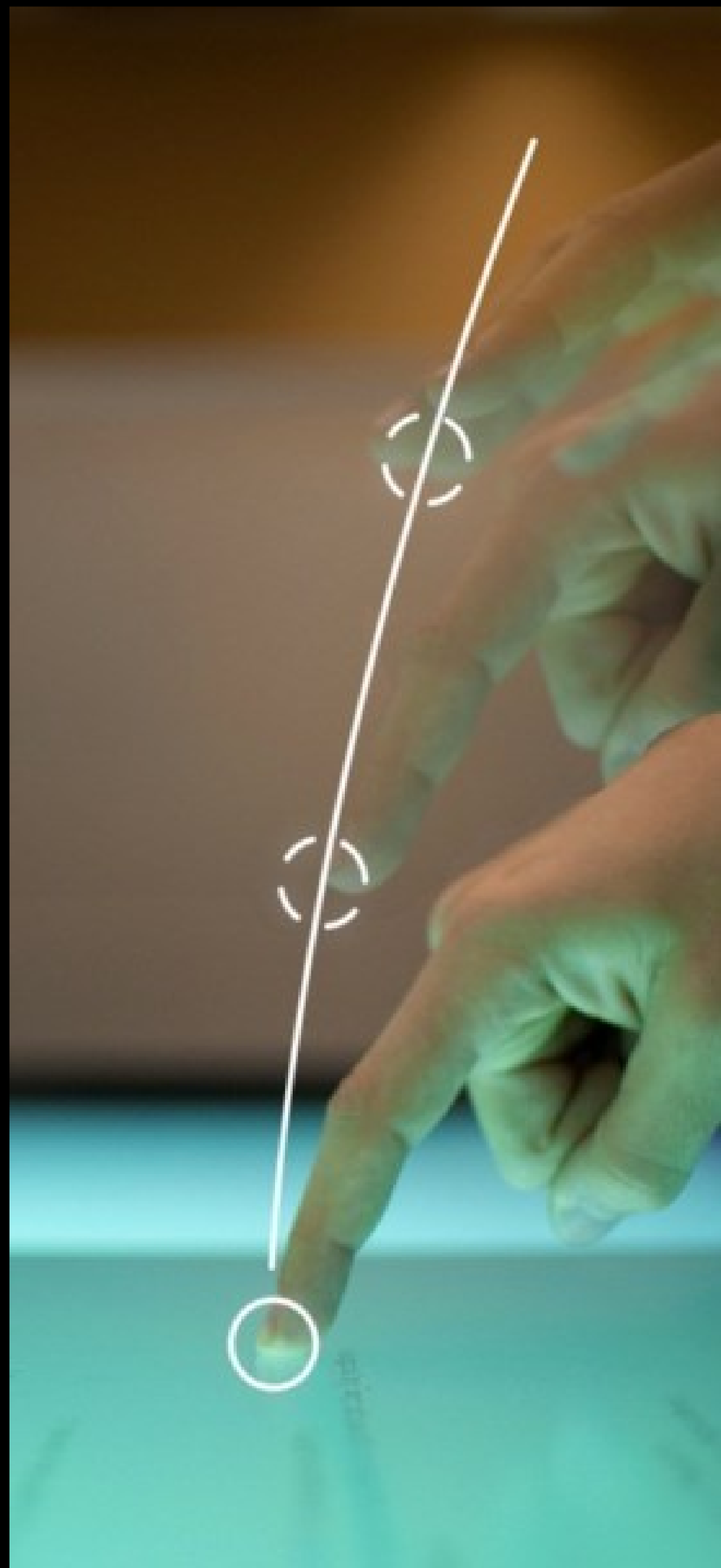
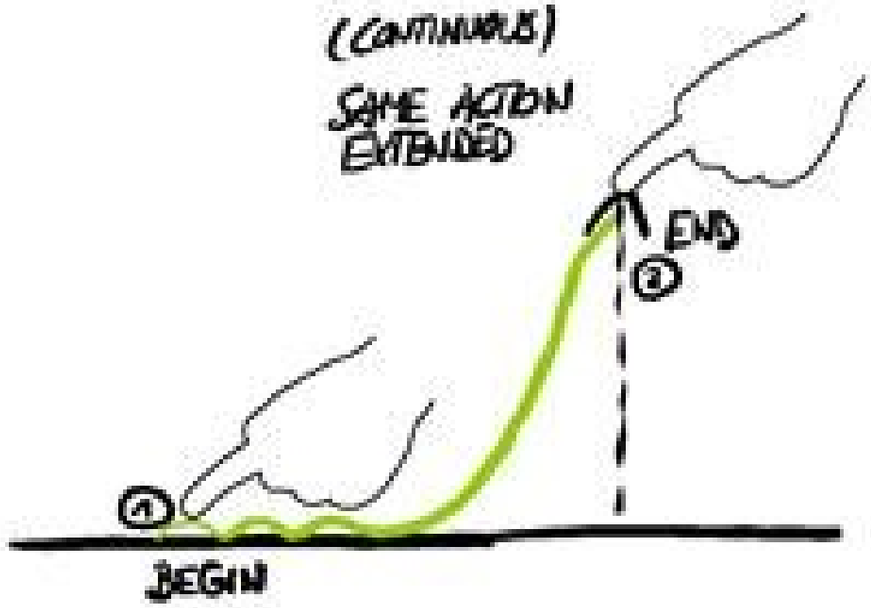
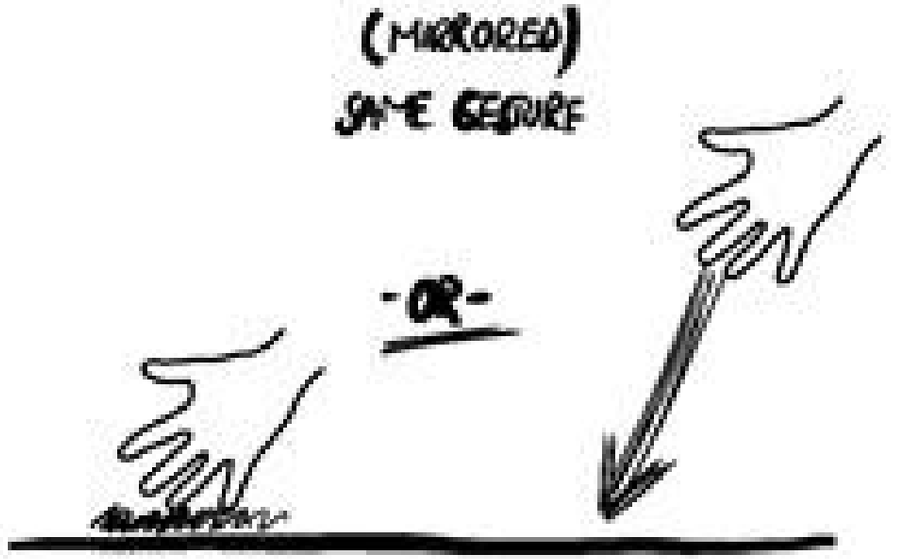
Continuous Interaction Space

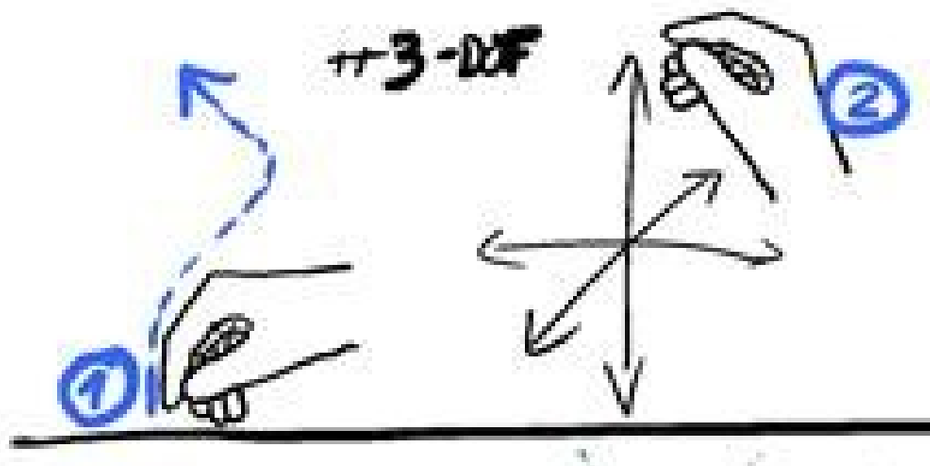
[Interact 2011]

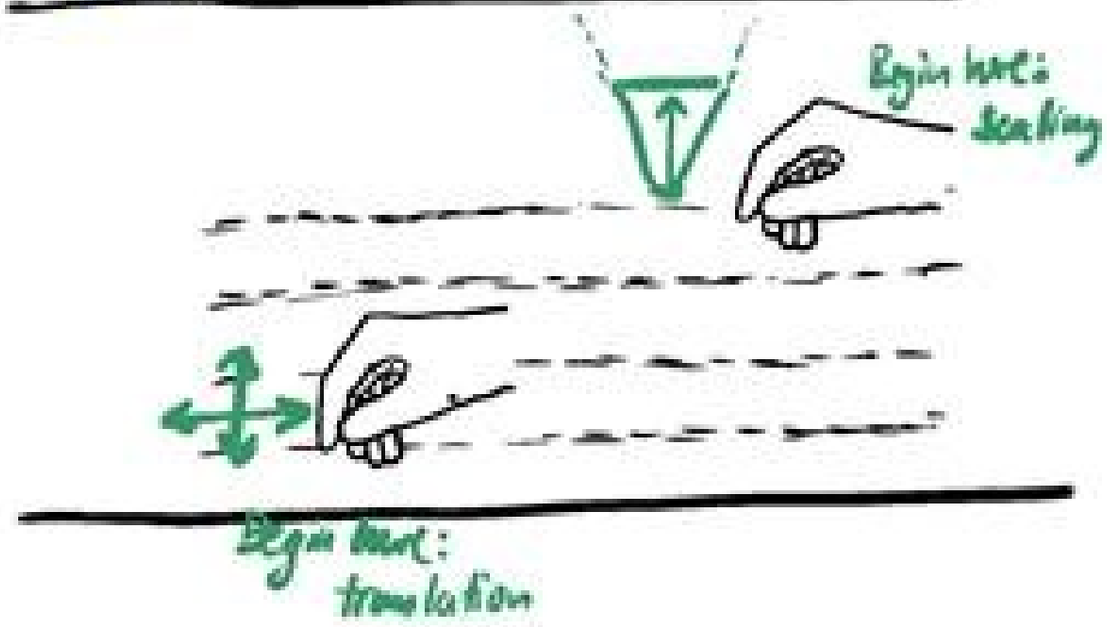


CONTINUOUS INTERACTION SPACE



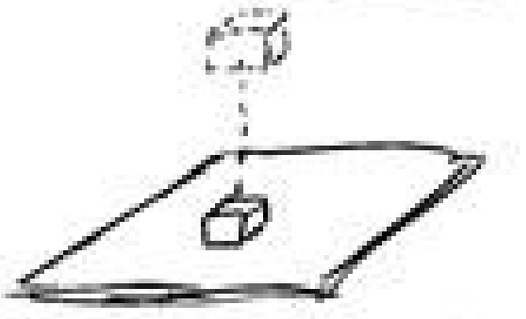






SPACES ABOVE SURFACES

① 3D SIMULATION / INTERACTION

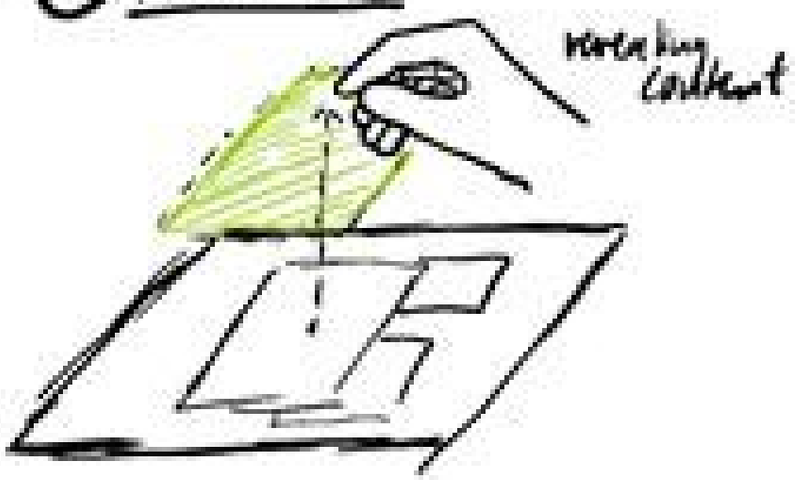


+ Interaction and Gestures

② INPUT PARAMETER

③ AWARENESS / FEEDBACK

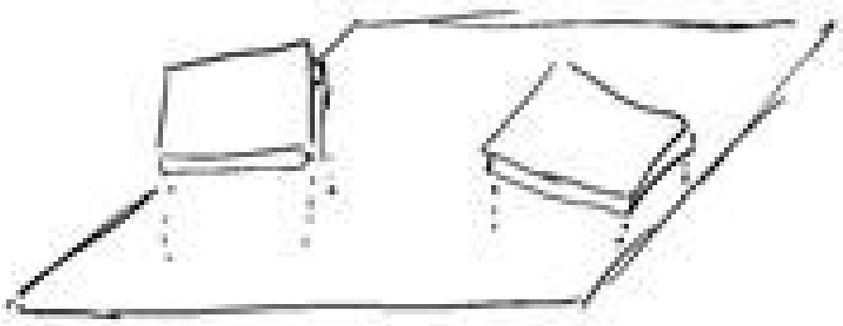
④ 2.5D INPUT



⑤ COMPLEX GESTURES

e.g. handover? hand roll/yaw/pitch?

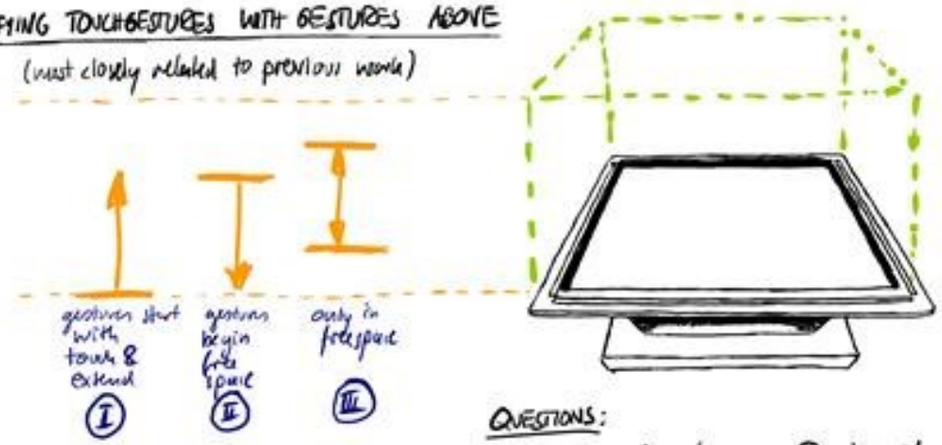
⑥ TOOL SPACE



Layers?

① UNIFYING TOUCHGESTURES WITH GESTURES ABOVE

(most closely related to previous work)



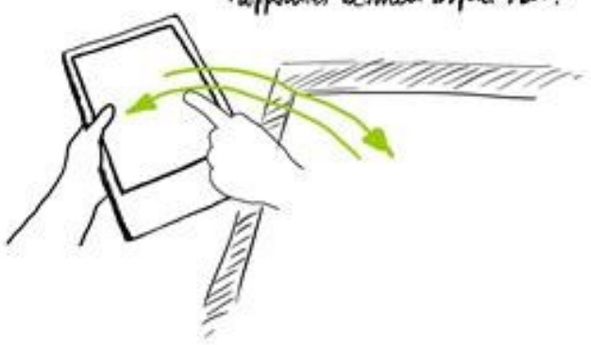
QUESTIONS:

- Type of gestures: ⓐ mirrored (?)
  ⓑ extended continuous
  ⓒ proximal
  → needs revision in paper
  → lookup Grossman's paper of Taxonomy
- Touch vs. space above
- personal preferences
- interaction regions

ⓐ GESTURES WITH 'TABLET'

(Tablet as surface)

- Which type of gestures?
- differences between surface / air?

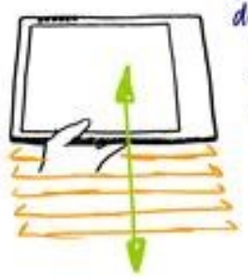


ⓑ TWO HANDED INTERACTION

Context / Frame / Stop / Mode

- Action
- Value → (continuous)

ⓒ LAYERS



Interaction with digital content layers

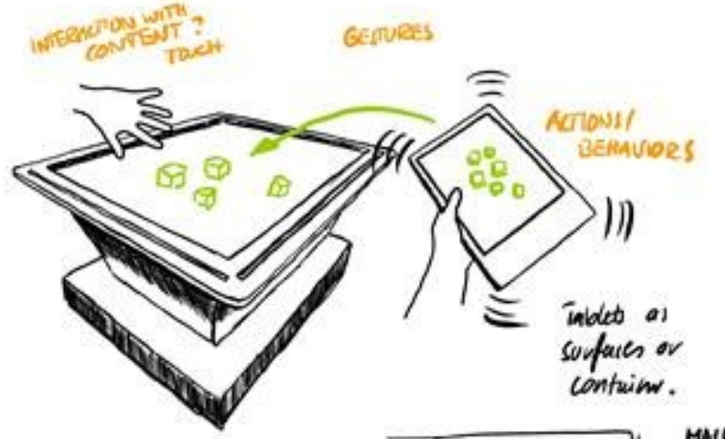
- Selection of layers
- Activation
  ⓐ view
  ⓑ manipulate
  ⓒ insert
  ⓓ revealing layers of data (→ lens)

ⓓ COLLABORATION

II ORIENTATION

② 2.5D INTERACTION / PHYSICAL SIMULATION

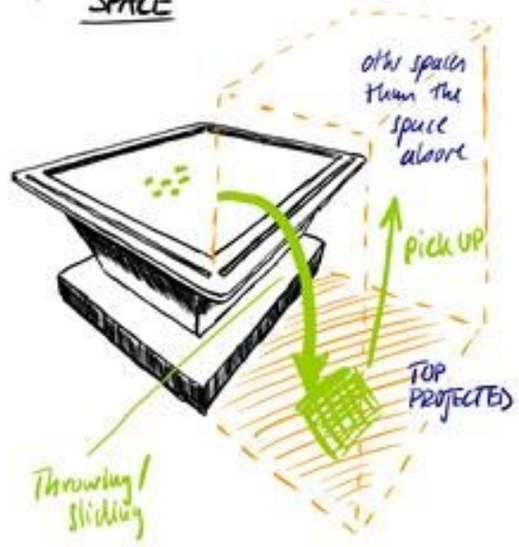
CONCEPT:
- Simulating natural behaviour of virtual objects on digital surfaces
- Providing natural "free space" interaction with digital content



- Moving / copying / cloning digital content
- Types of content?
- Gestures to interact? swipe, drag, flick
- Behaviour of devices?

EXTENSIONS:

ⓐ EXTENDED SURROUNDING SPACE

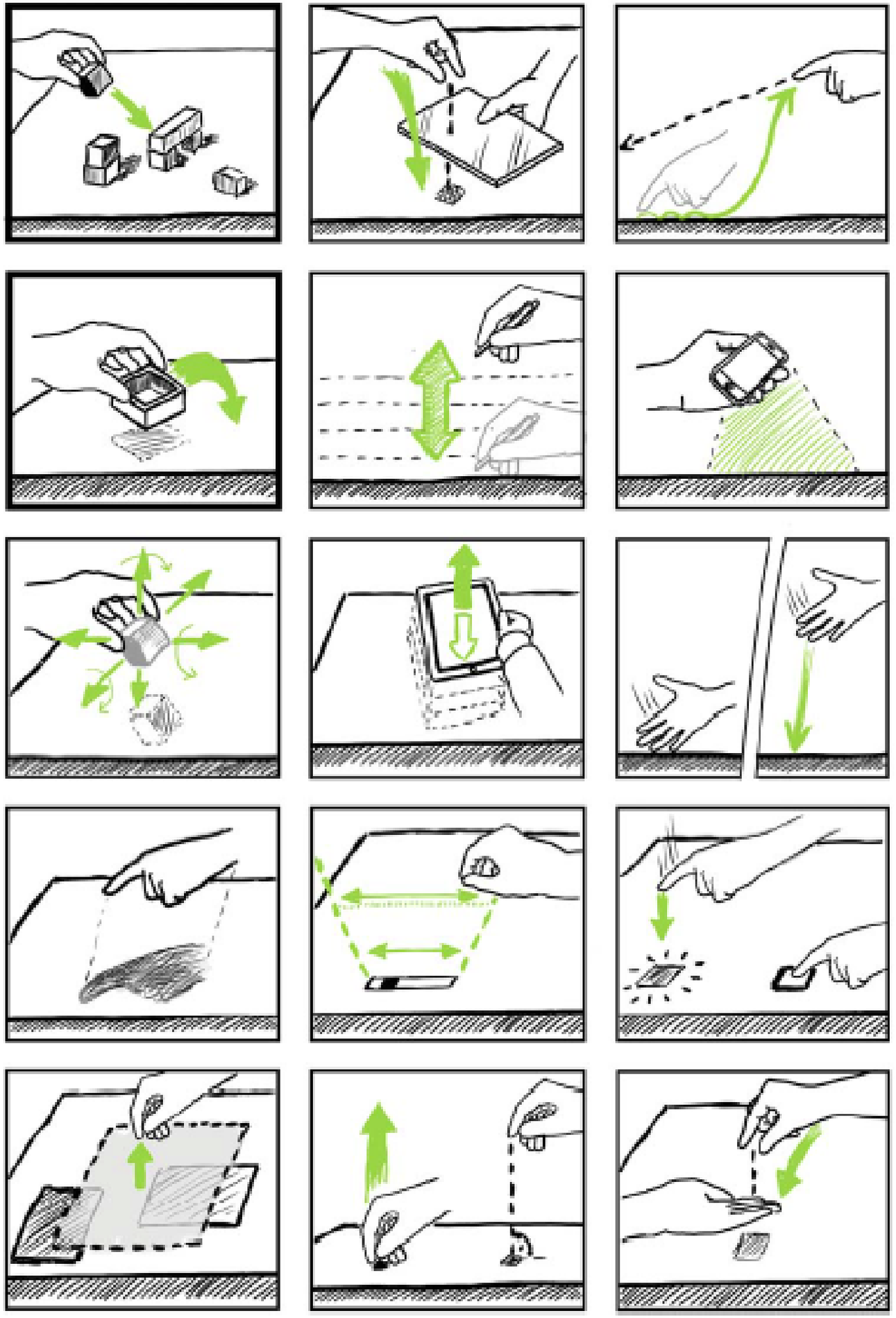


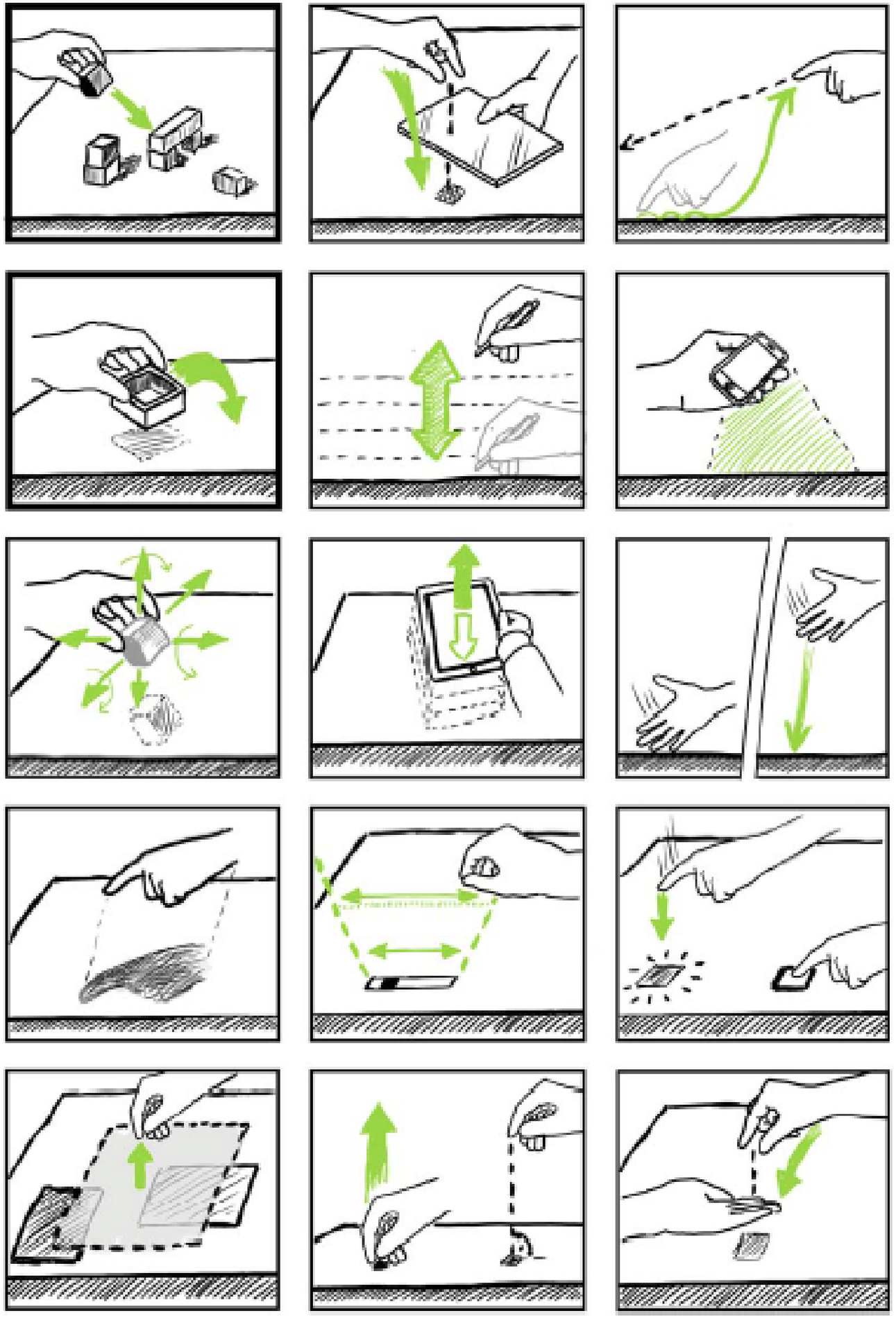
- Forms of interaction?
- Behaviour of data / content

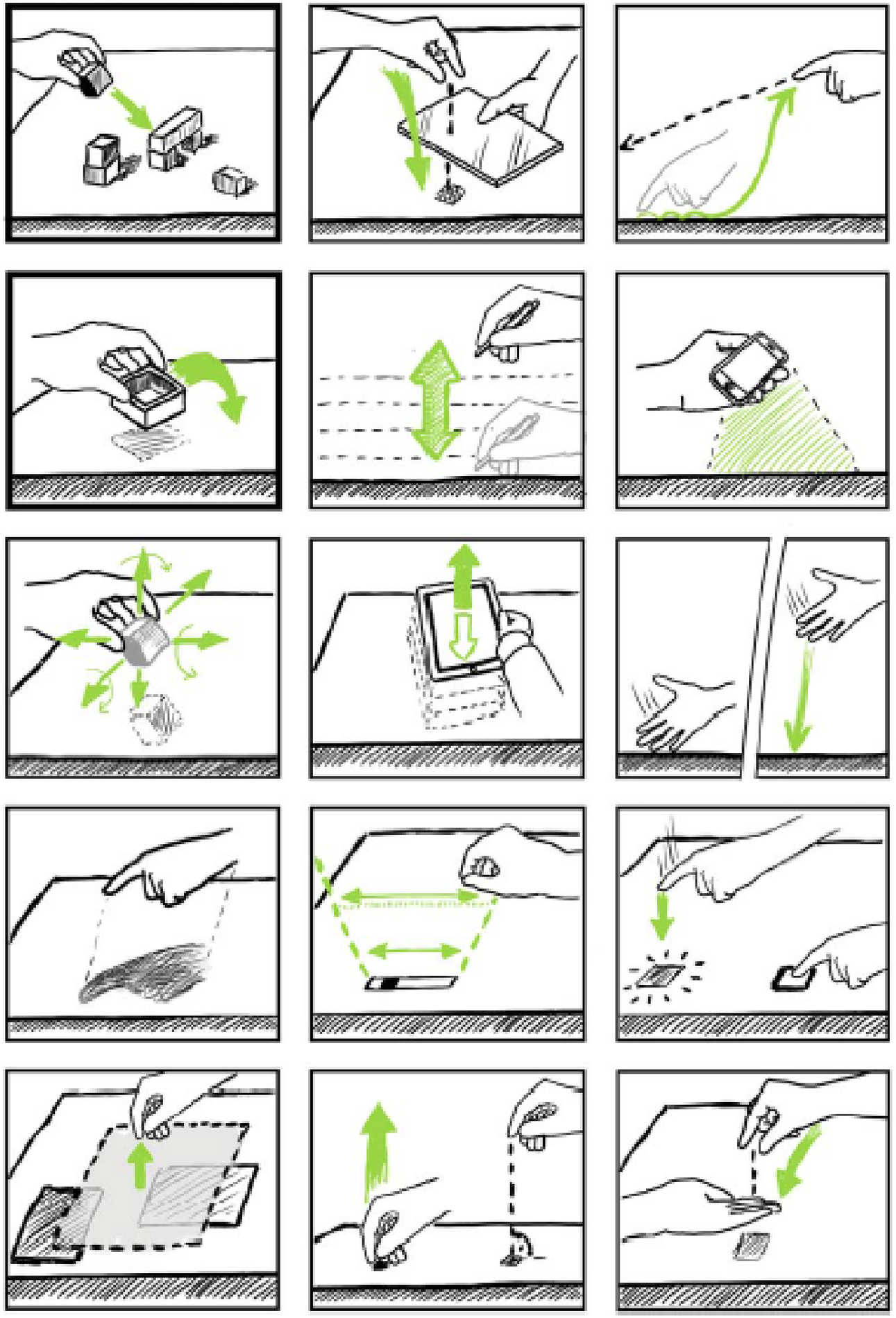
ⓑ PHYSICAL ARTEFACTS

- Trackables
- Boxes / Containers
  → other objects?

- How to integrate?
- How to provide adequate feedback?
- Other tangible objects? Controls?

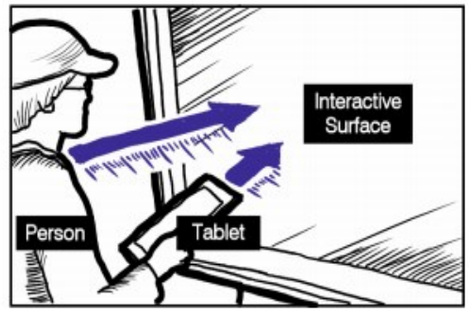


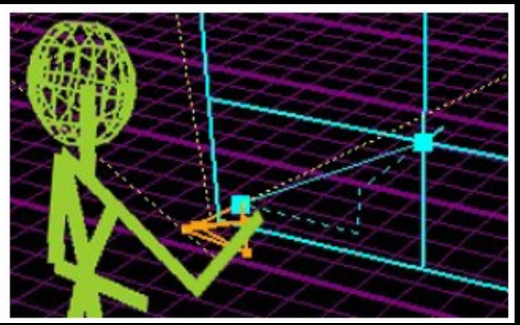


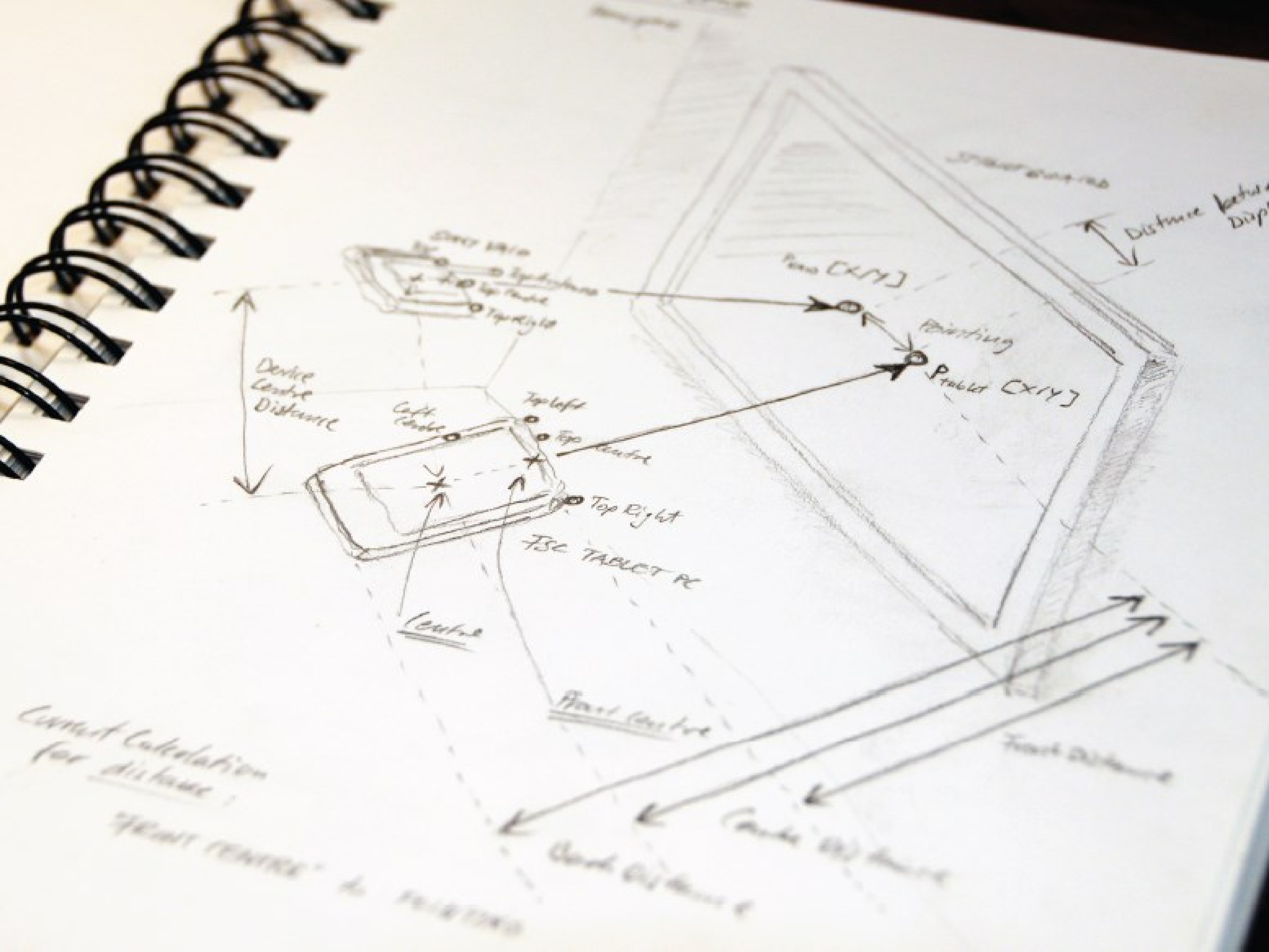


Proximity Toolkit

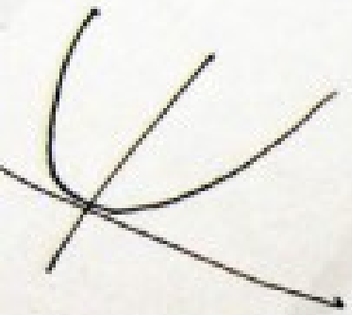
[UIST 2011]

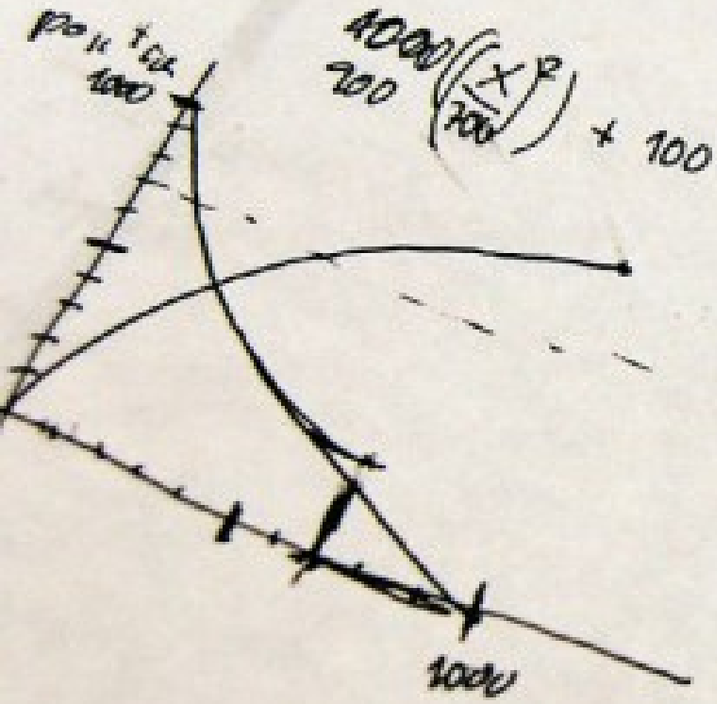


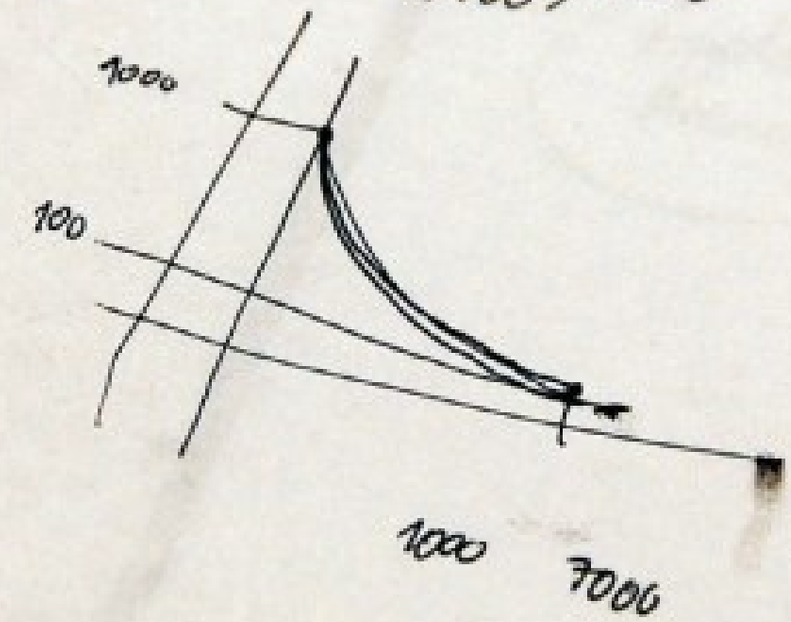


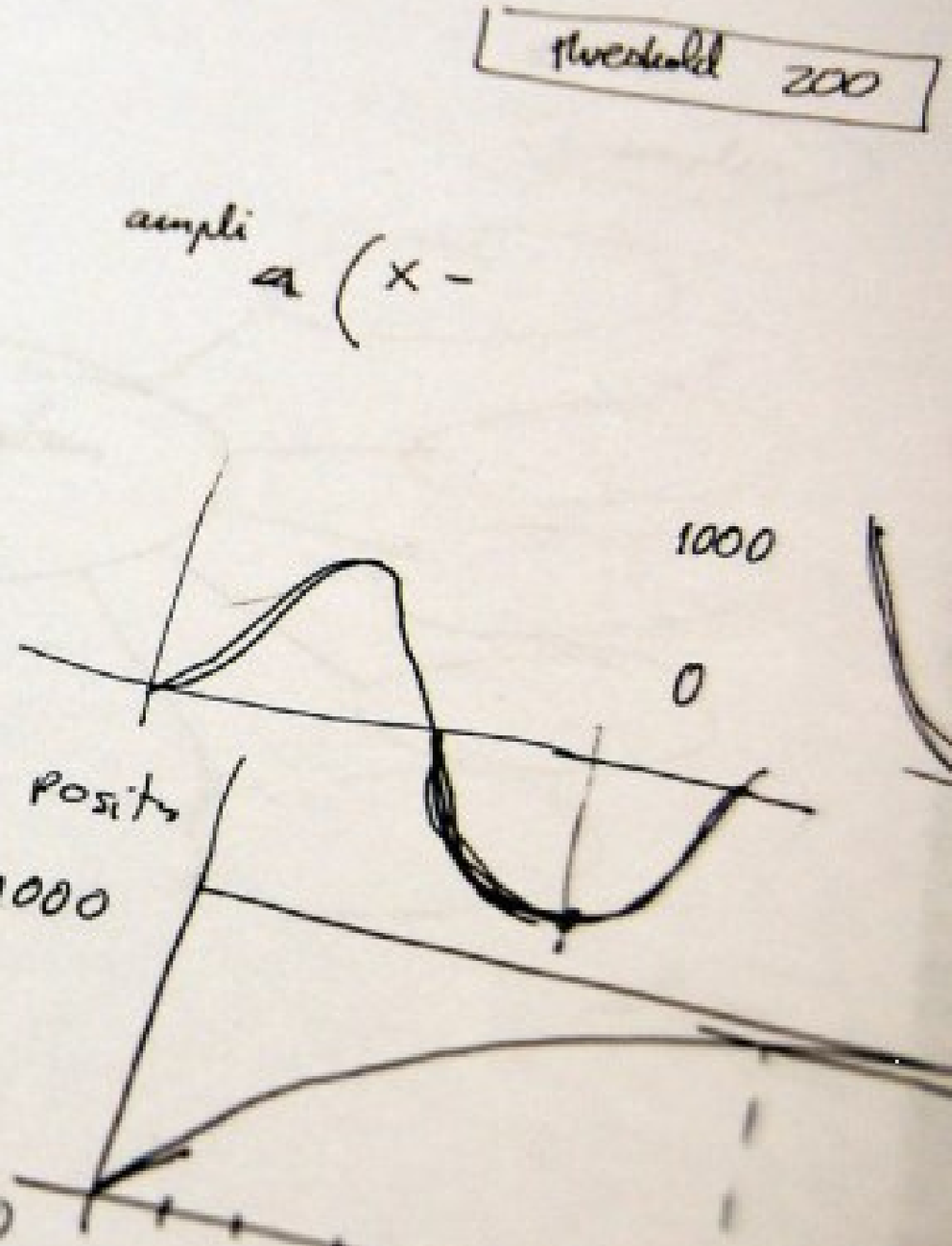


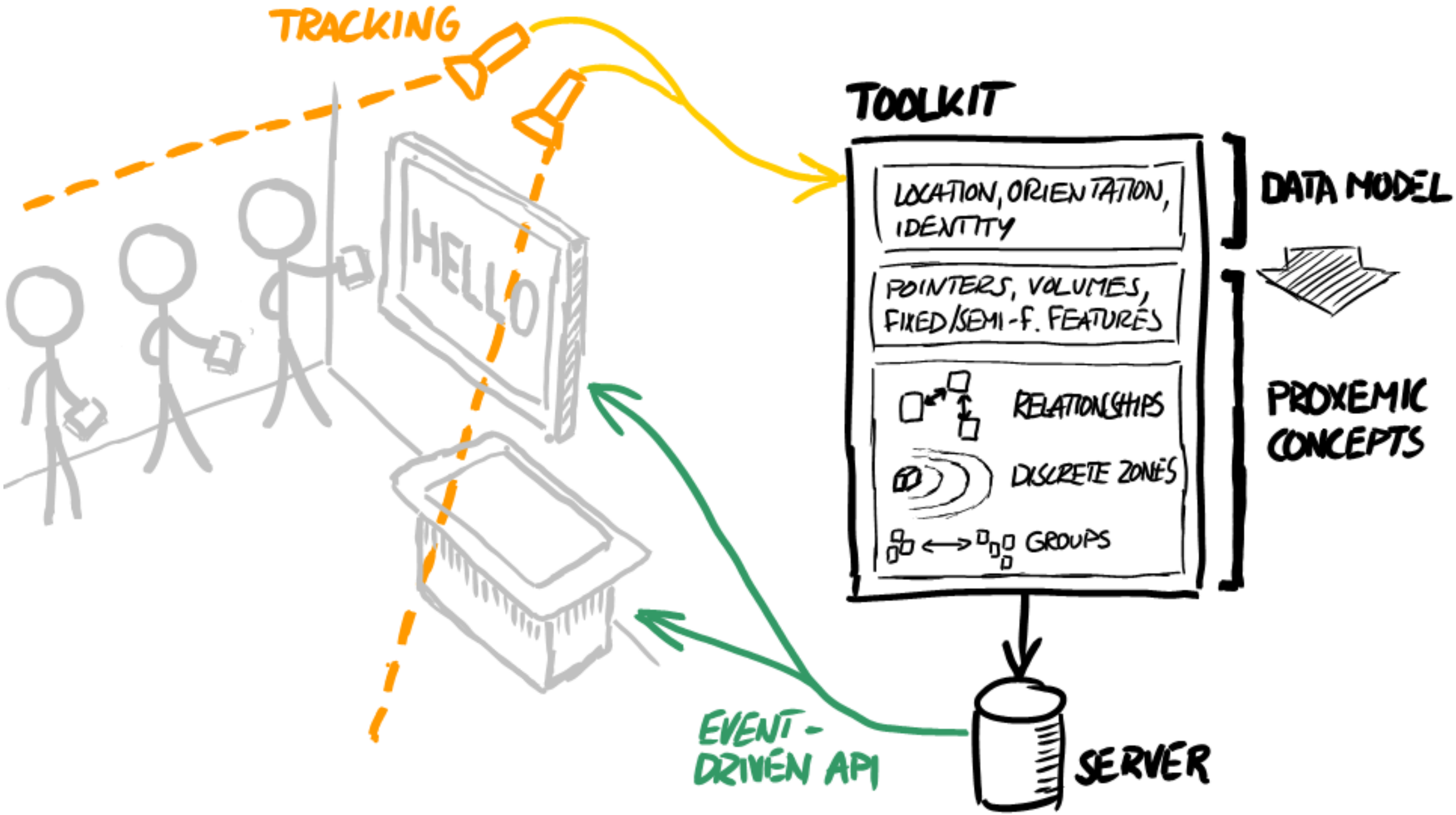
Pointing
Ptablet [X/Y]
Device Centre Distance
Left Centre
Top Left
Top Centre
Top Right
FSC TABLET PC
Centre
Front Centre
Current Calculation for distance:
"FRONT CENTRE" to POINTING

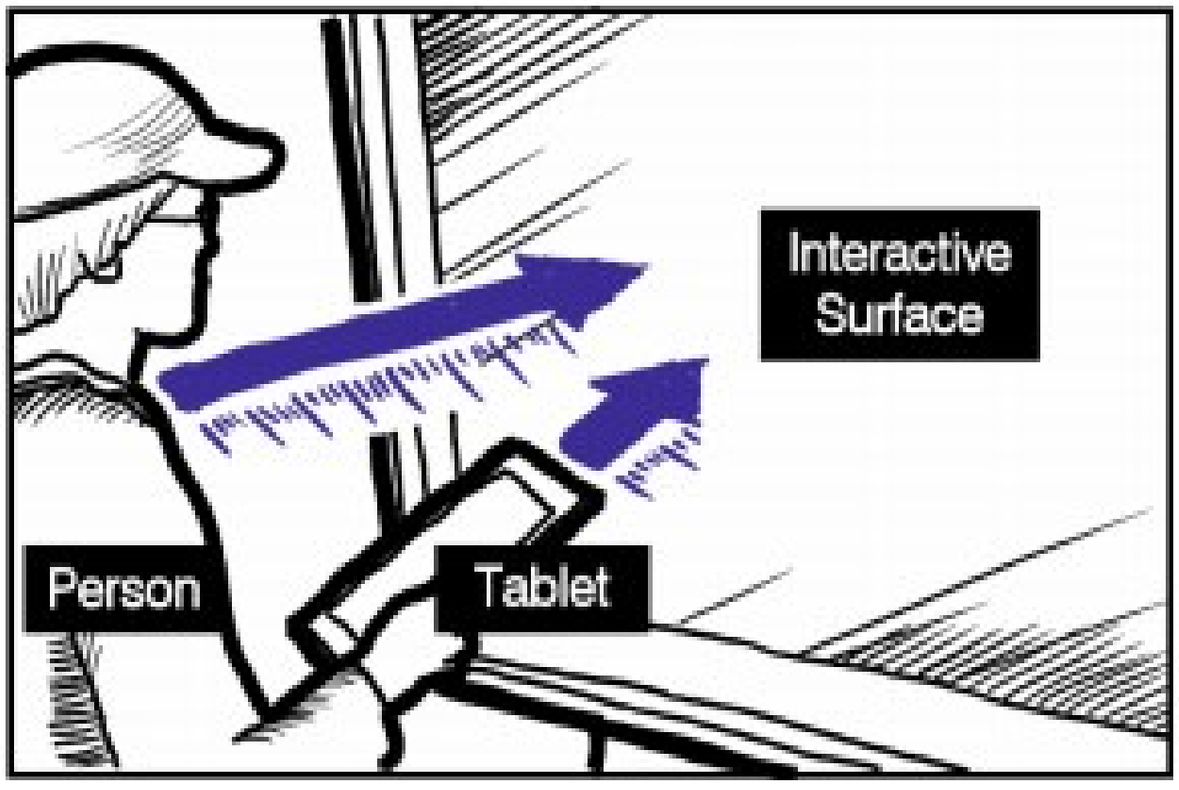


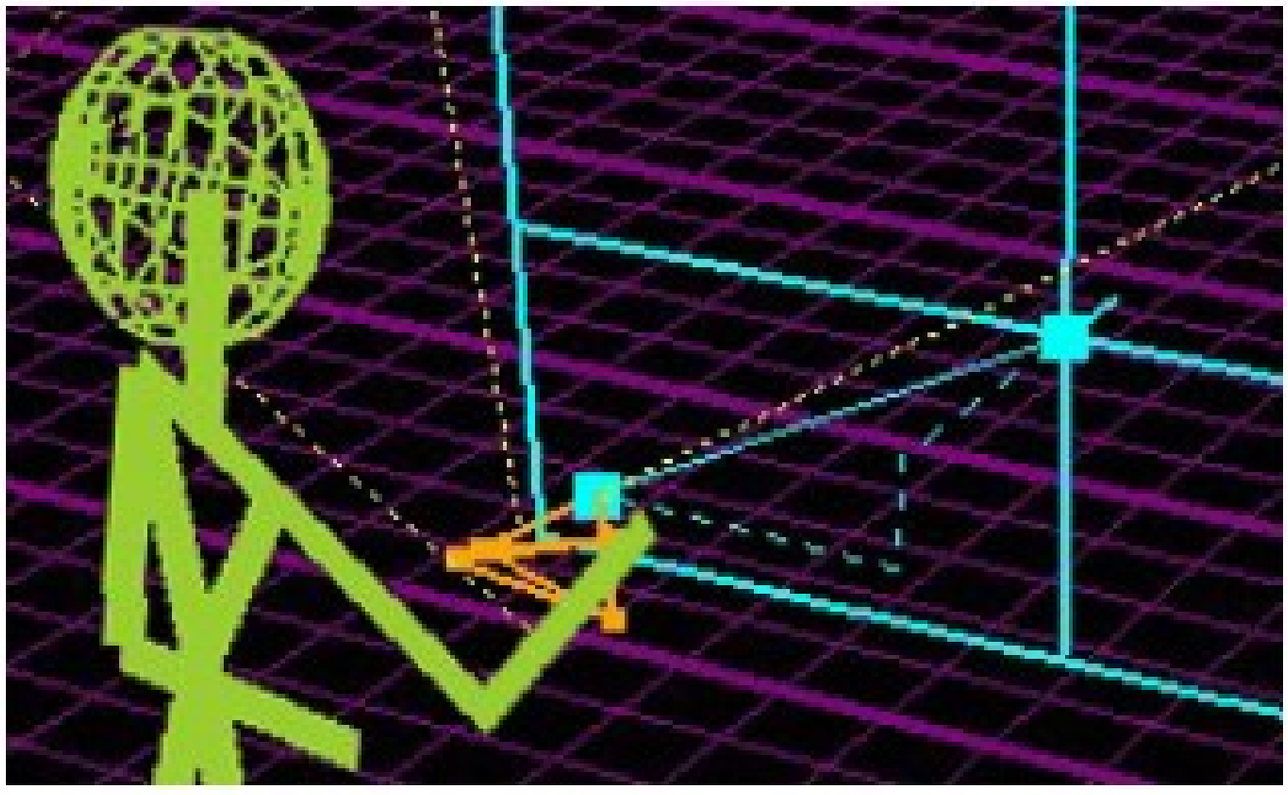






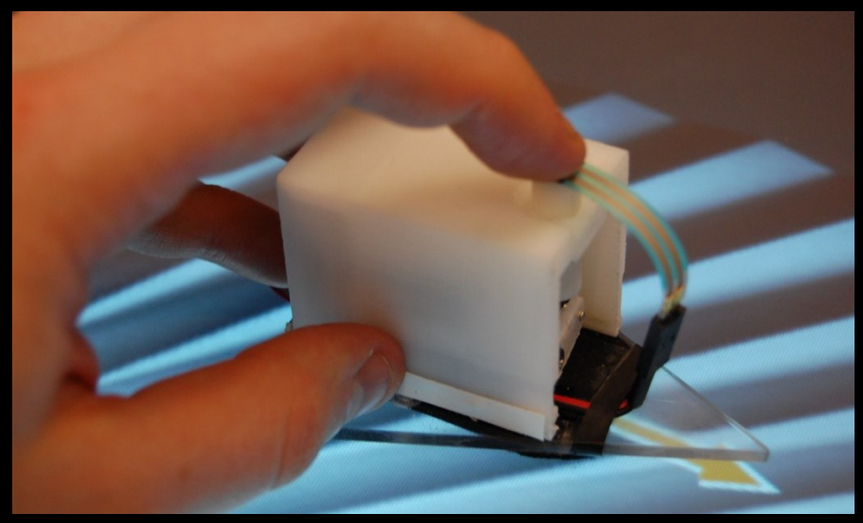

TRACKING
HELLO
TOOLKIT
LOCATION, ORIENTATION, IDENTITY
POINTERS, VOLUMES, FIXED/SEMI-F. FEATURES
RELATIONSHIPS
DISCRETE ZONES
GROUPS
DATA MODEL
PROXEMIC CONCEPTS
EVENT-DRIVEN API
SERVER

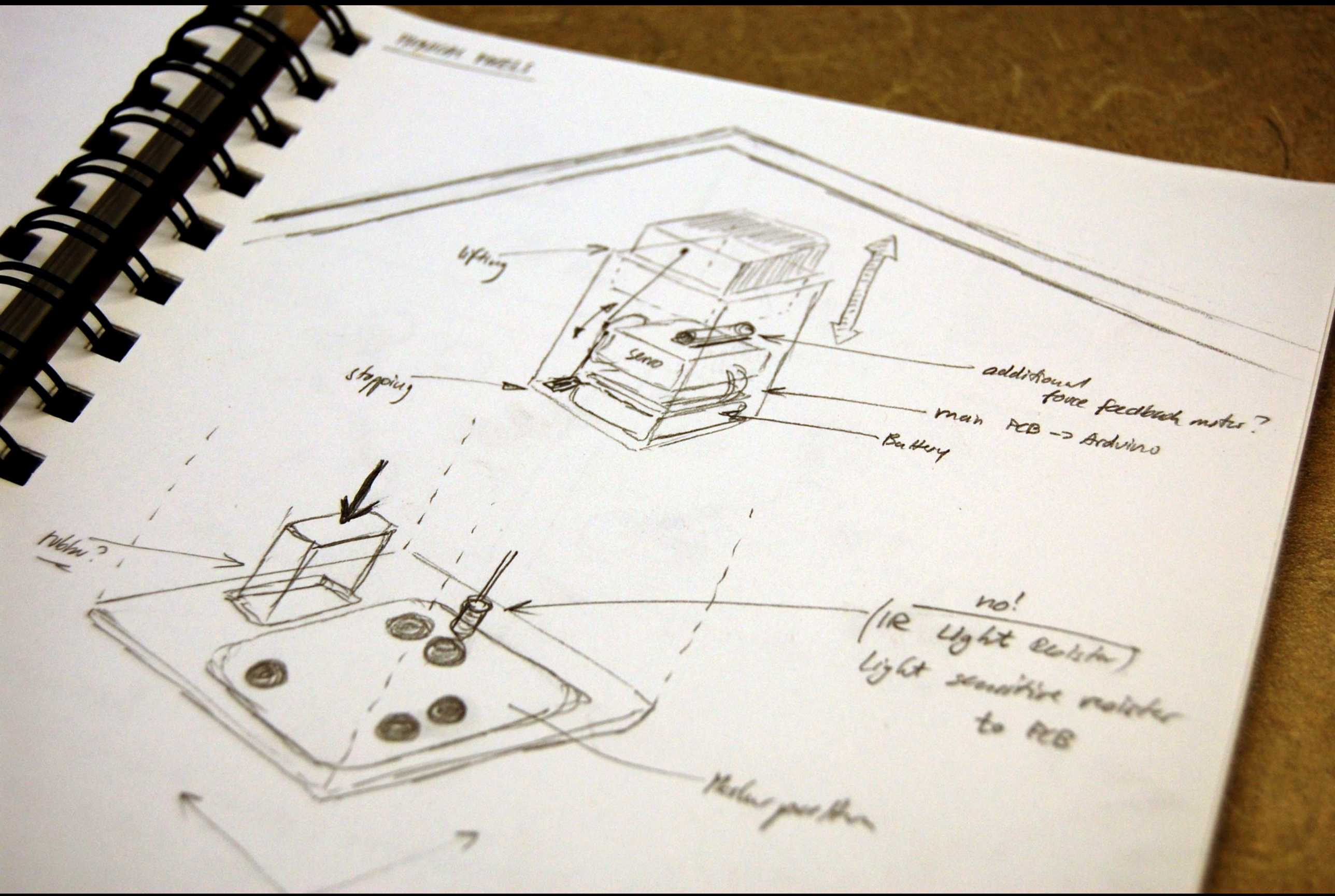

Interactive
Surface
Person
Tablet



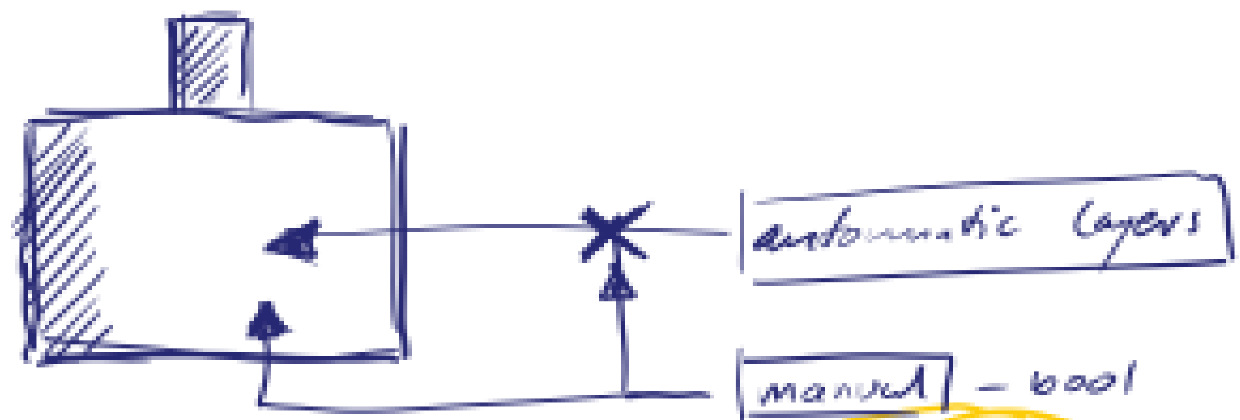
Haptic feedback on tabletops

[ITS 2010, TEI 2012]




servo
additional force feedback motor?
main PCB -> Arduino
Battery
no!
(IR Light detector)
Light sensitive resistor to PCB

HIP PROPERTIES



– bool

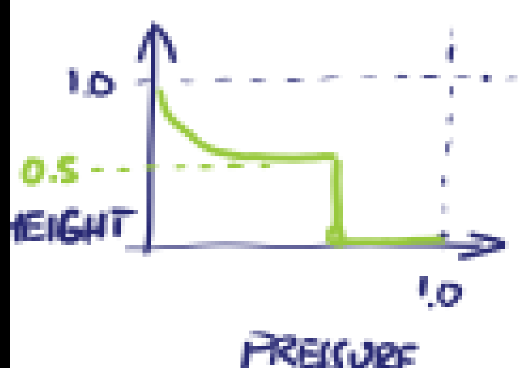
- amplitude
- oscillation freq.
- material (haptic response)
- height

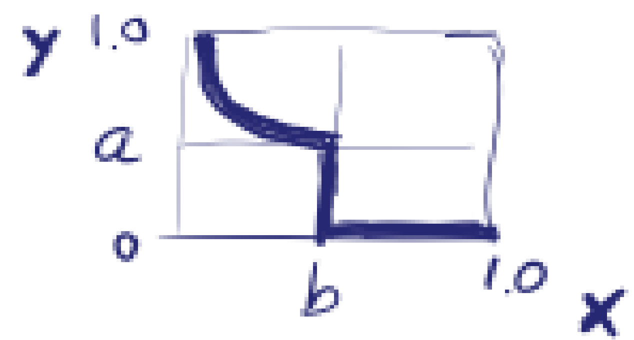
getter/setter methods!

TIMING:

setOscillation (amp, osc, time) – OR – · setOscillation (preset.x)

RESPONSE FUNCTION



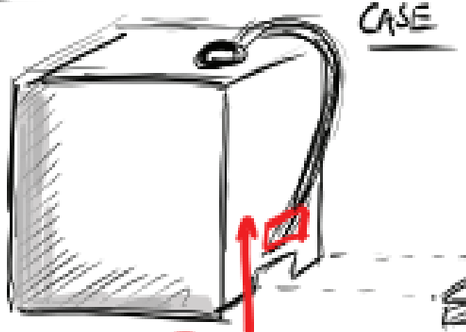


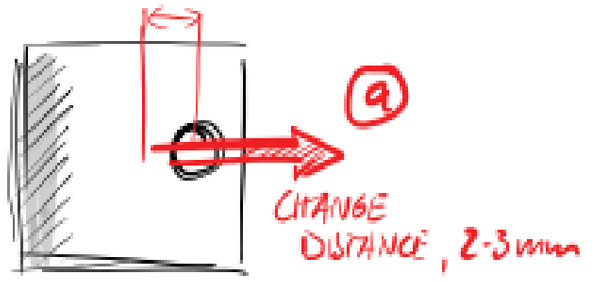
$$y = \alpha \cdot x^2 + \beta x + 1$$

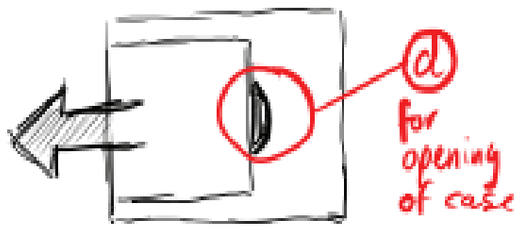
$$\alpha = -4(a-1) / (4 \cdot b^2)$$

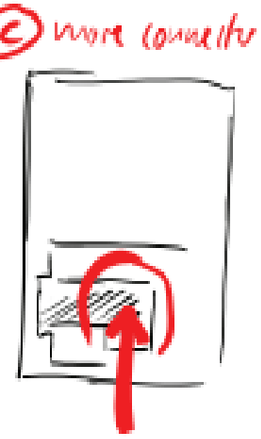
$$\beta = -\alpha \cdot 2 \cdot b$$

1 DEFAULT DESIGN









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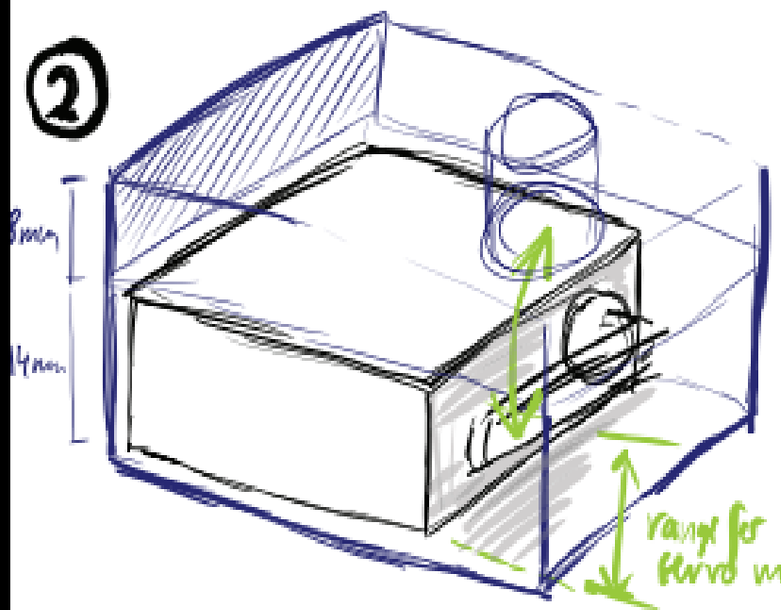
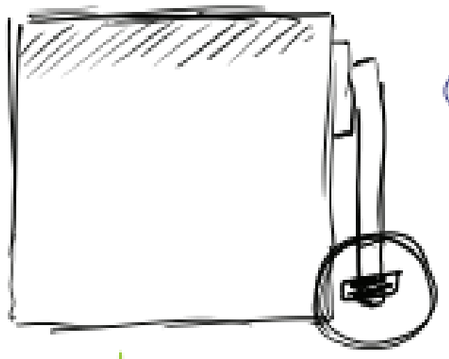
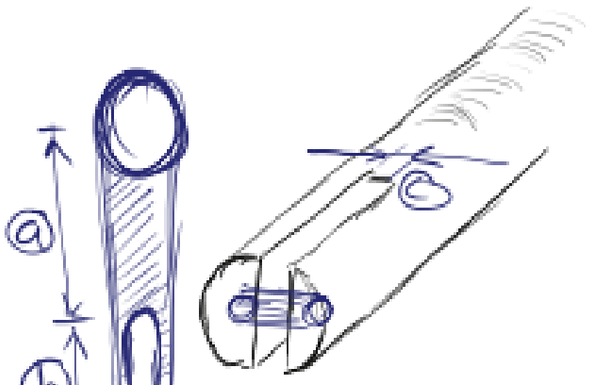
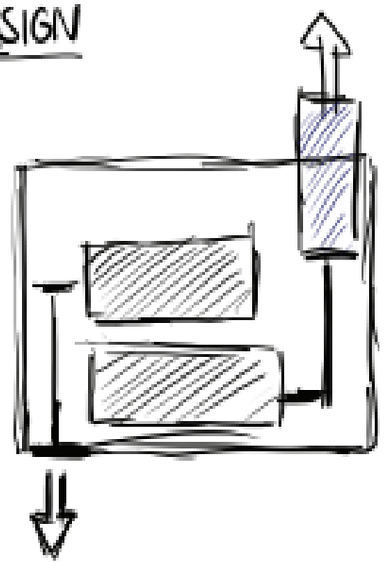






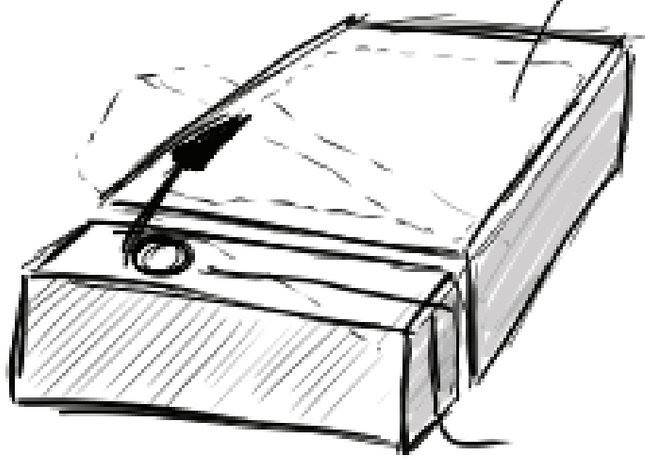
3 COMPLETE DESIGN

minimum design with servos for rod & brake

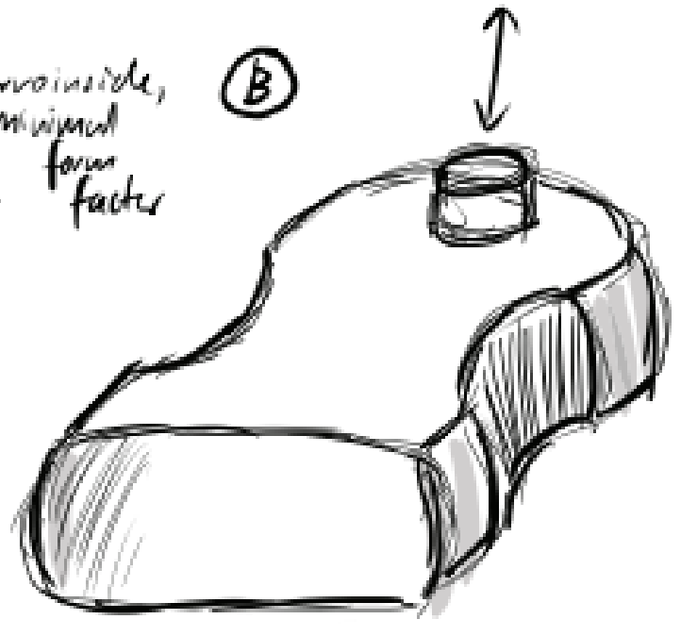


→ using metal gear servo only for rod, not for brake

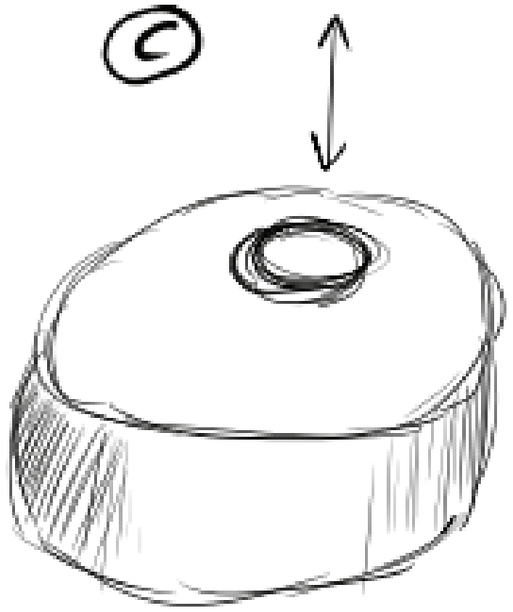
A



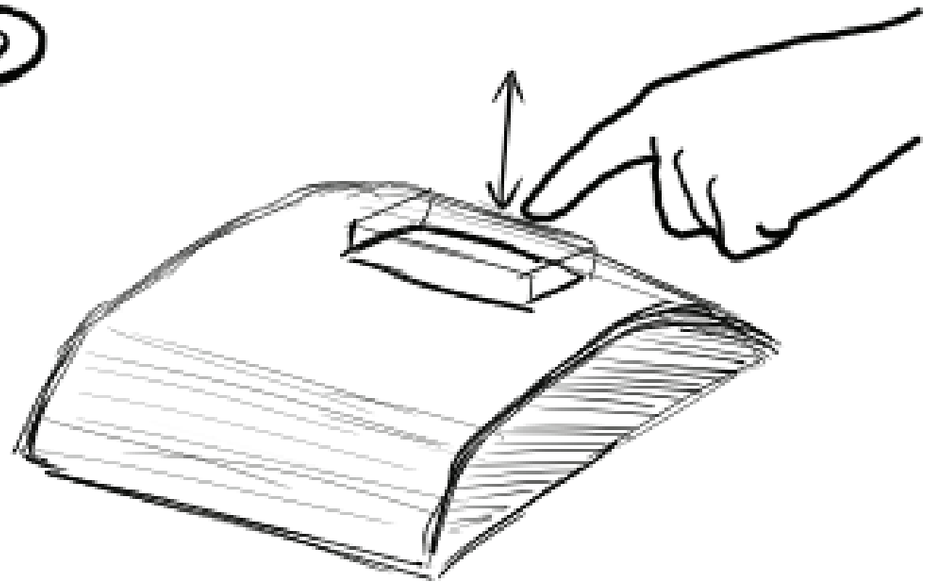
B



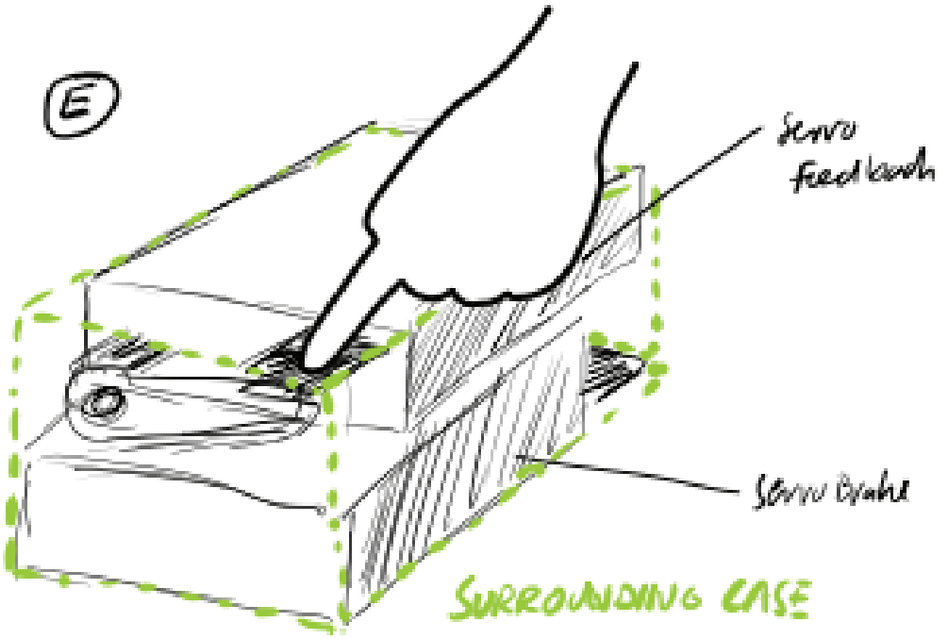
C



D

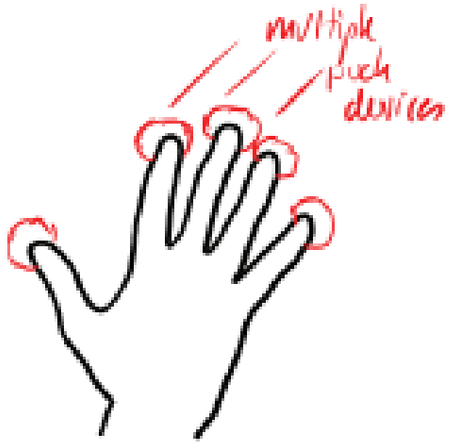


E



APPROACHES

1. Small device form factors -> minimized size
2. Form design / ergonomic design / affordances
3. Multiplicity -> 3a in one device
   3b multiple devices



Hand- and handpart-aware tabletop interactions

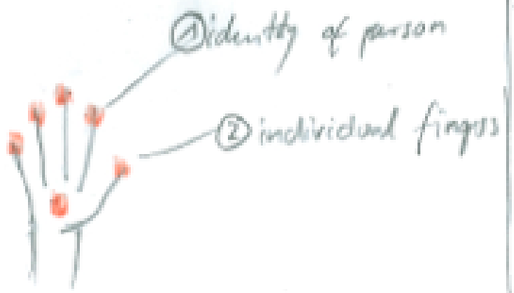
[ITS 2010, ITS 2011]

MICROSOFT SURFACE IDENTITY PROJECT

→ related : Ed's project, gestures
Diamond touch

→ Mike Wu's paper about hand postures

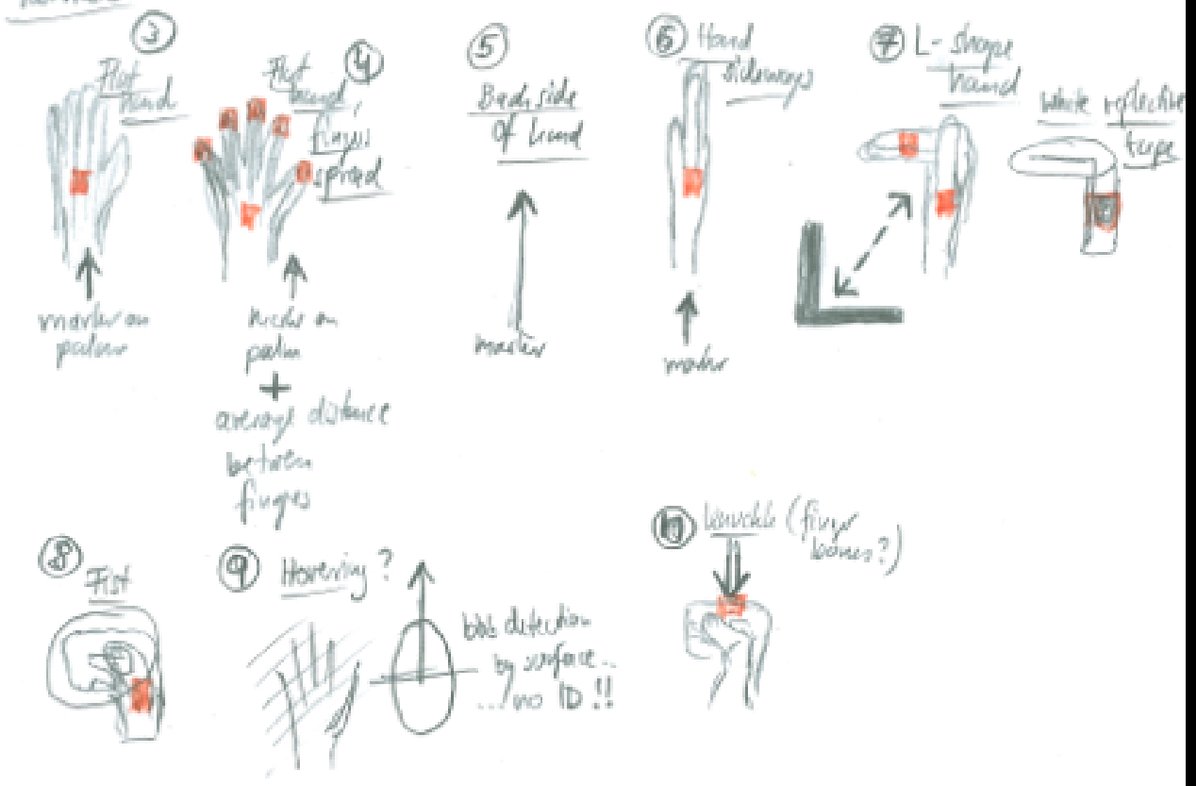
BYTETAG



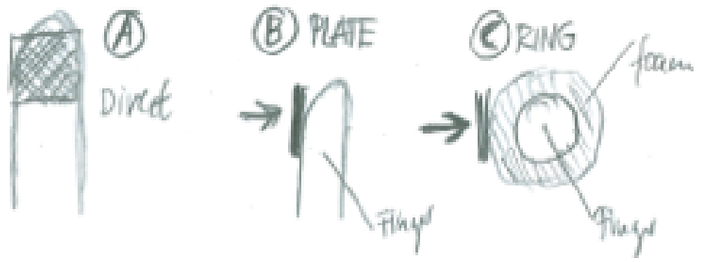
Applications

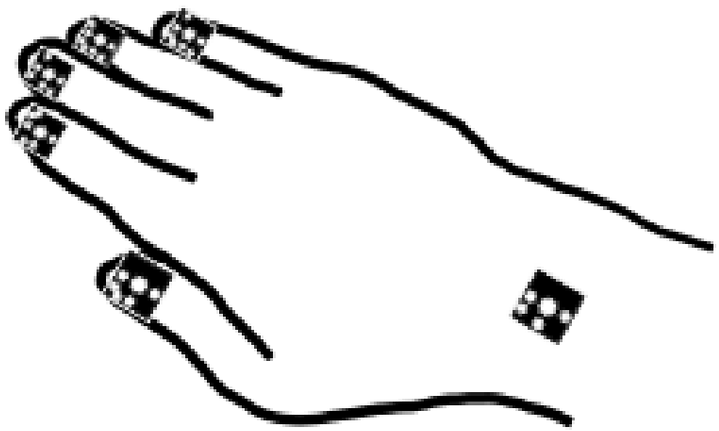
- Painting : one finger paint, another erase
- Multicolor painting
- Finger-tools : cutting, warping, moving
- Documents : cut, move, copy, scale
- menu on specific finger
- other tools??
- Multi user applications -> Identity

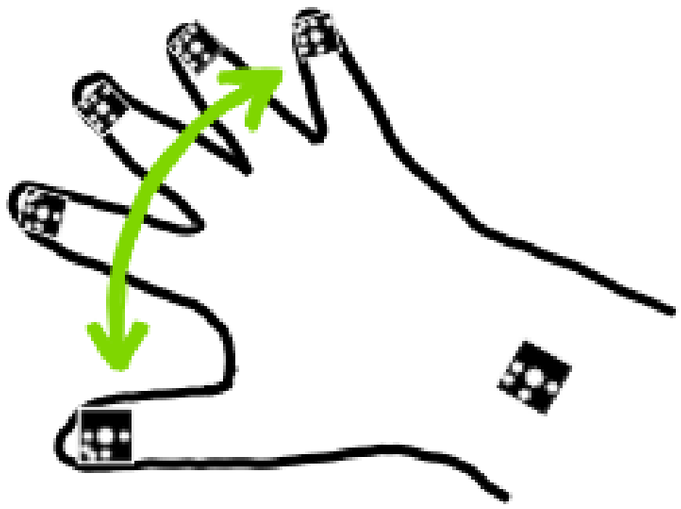
POSTURES

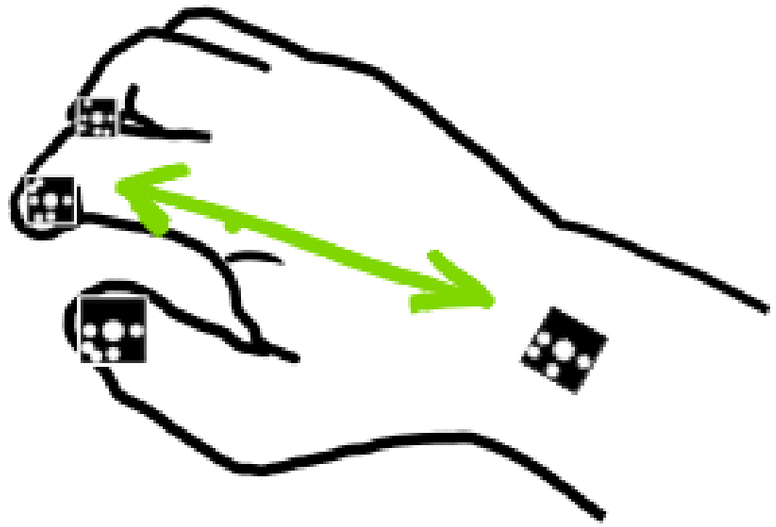


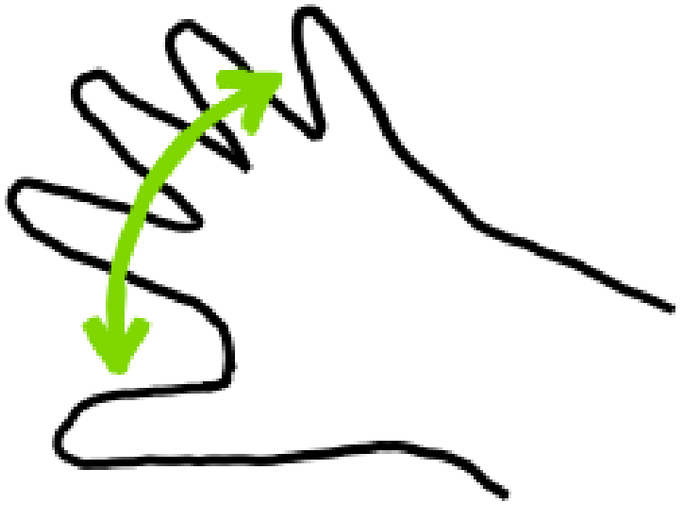
PLACING MARKERS

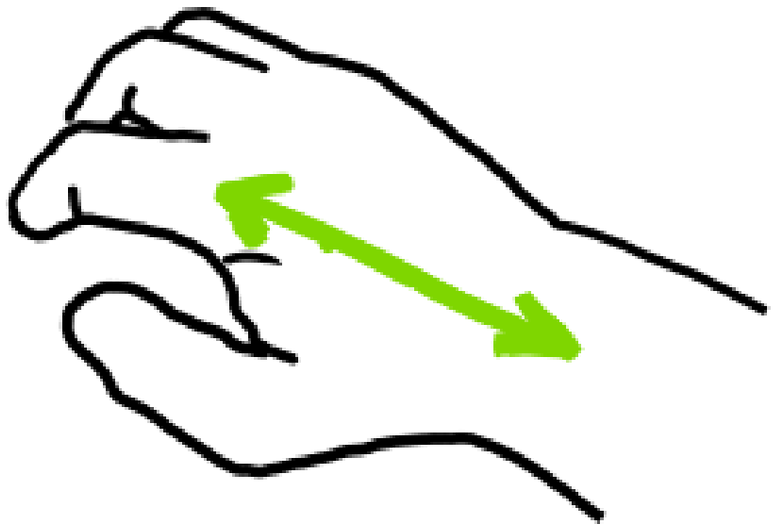


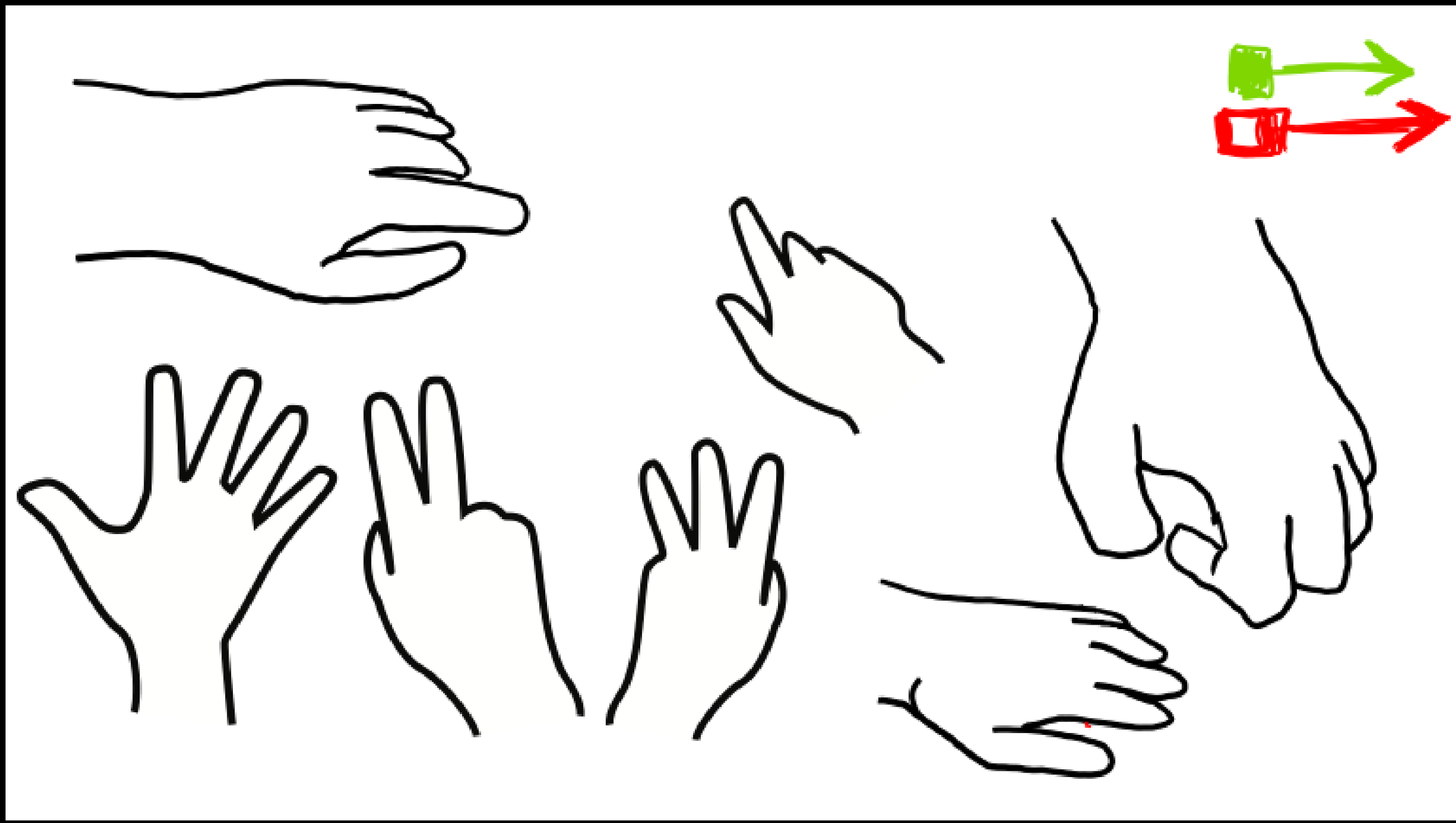


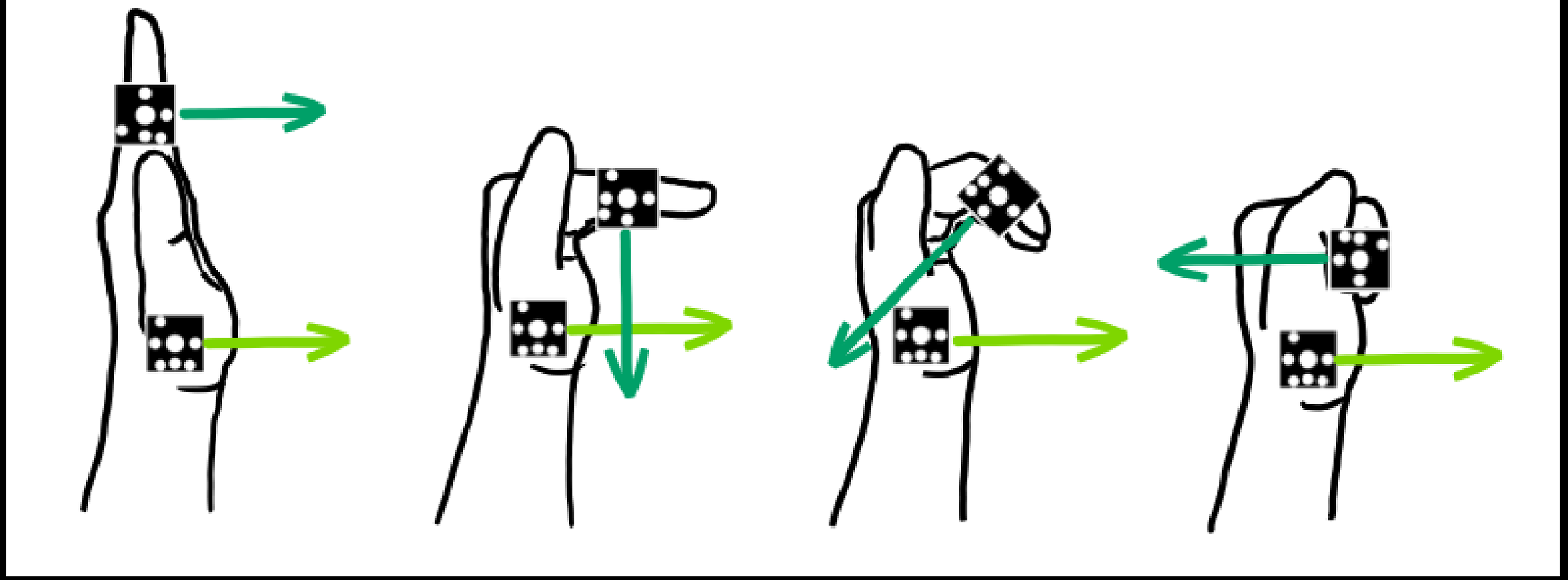


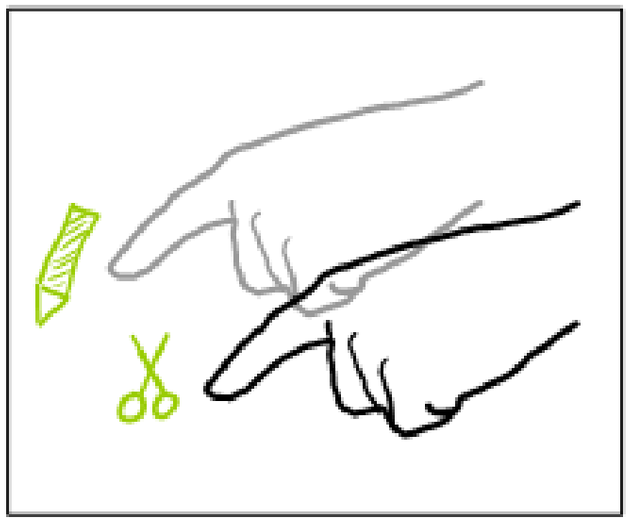


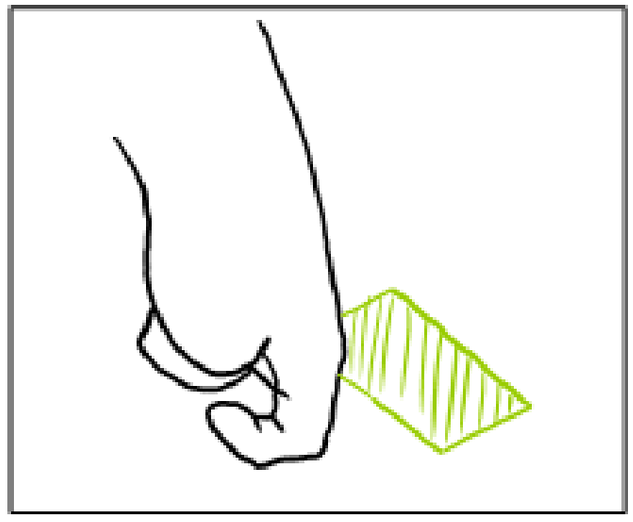


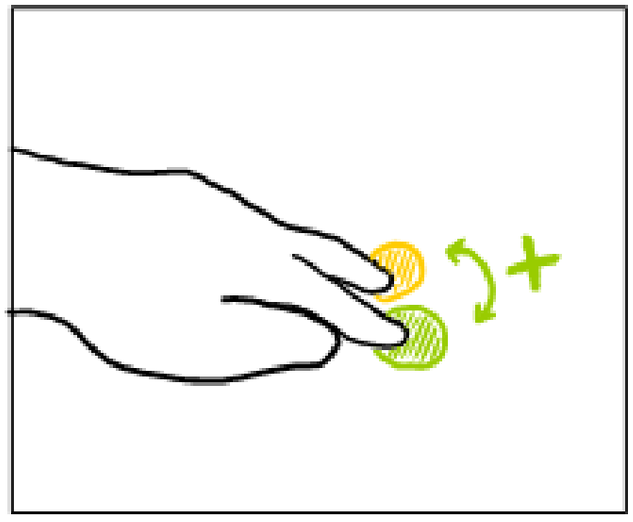


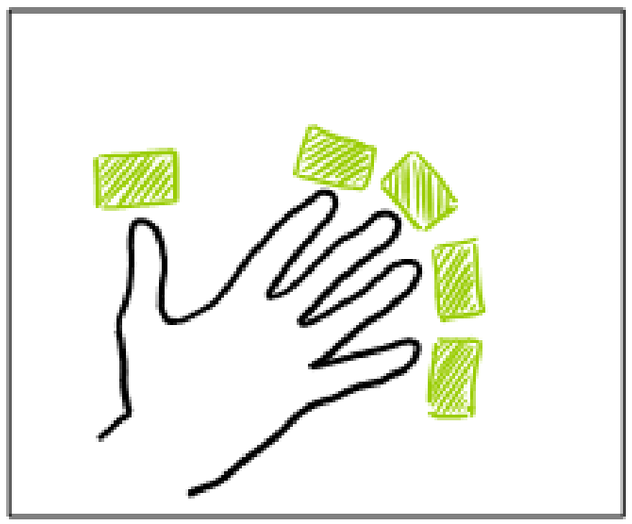


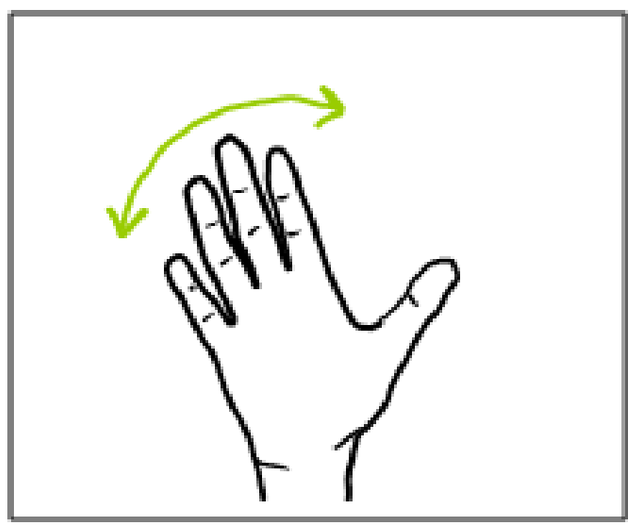


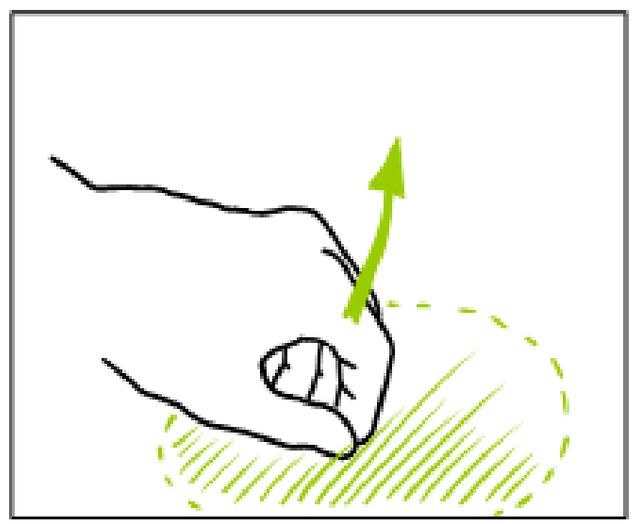


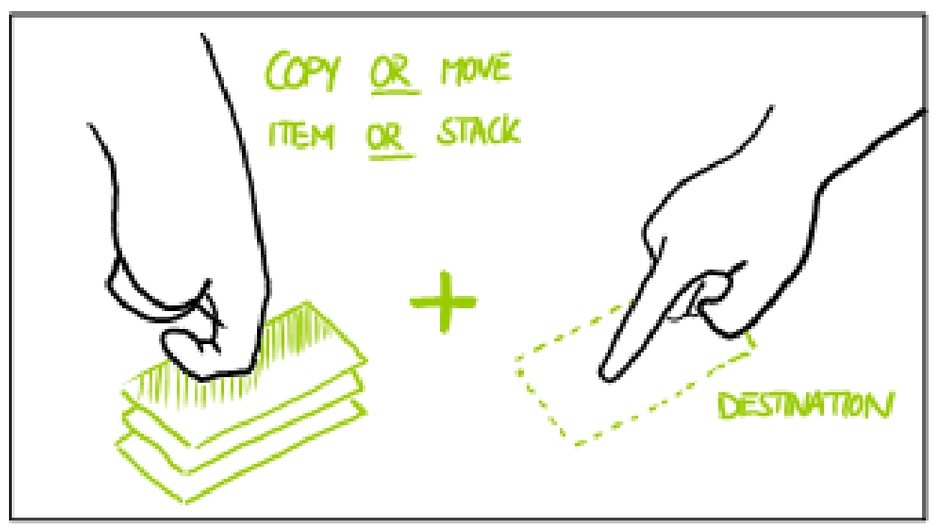


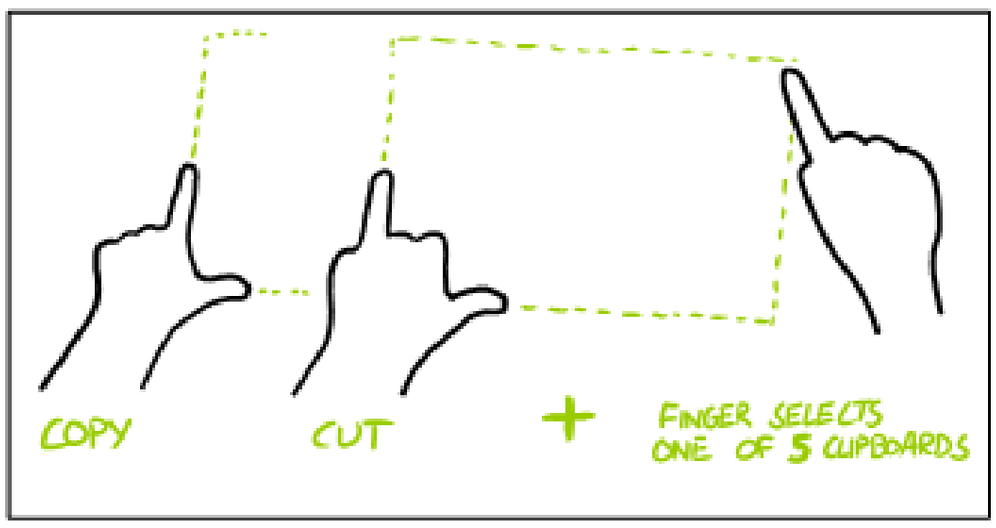








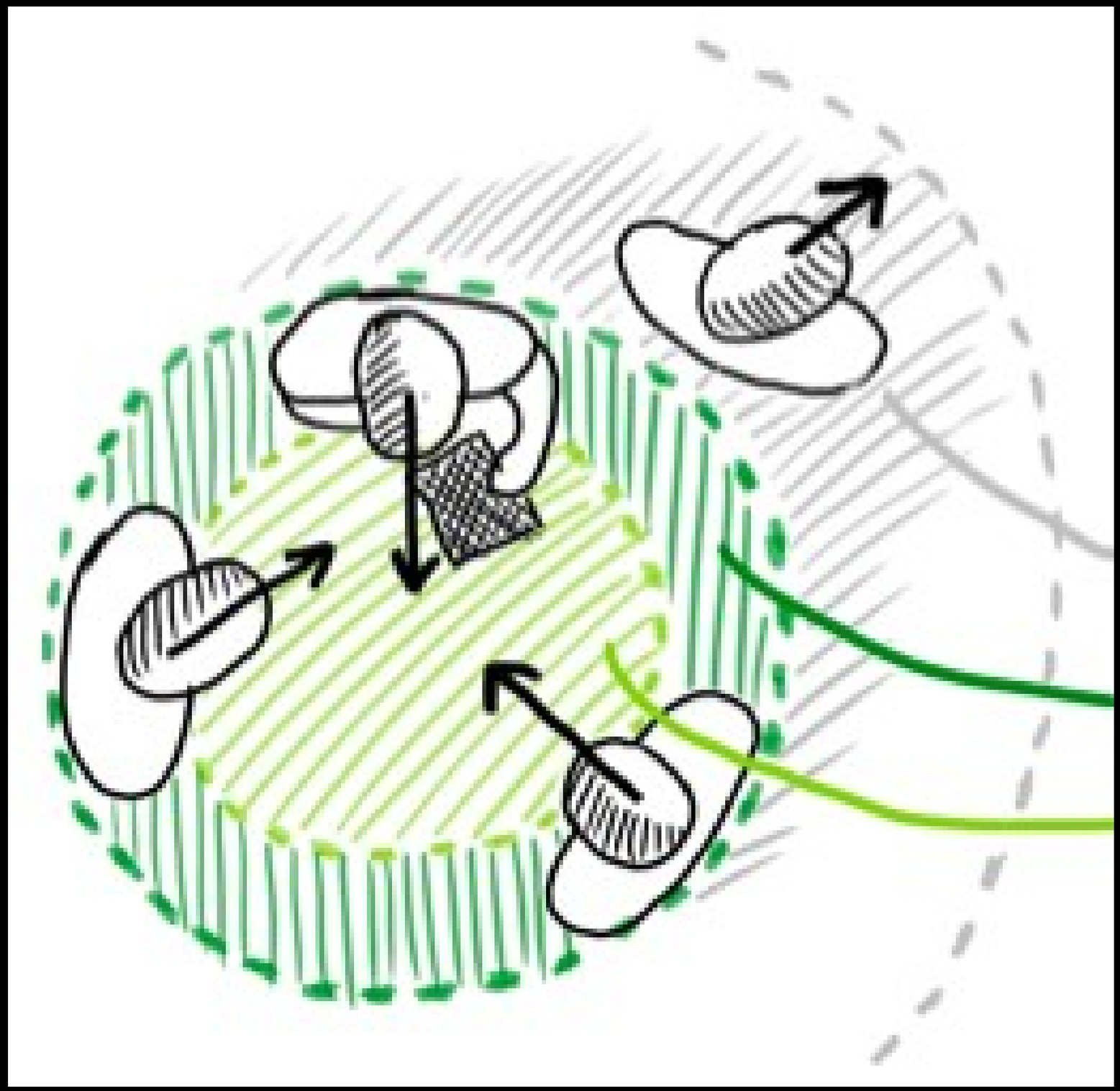

COPY OR MOVE
ITEM OR STACK
DESTINATION

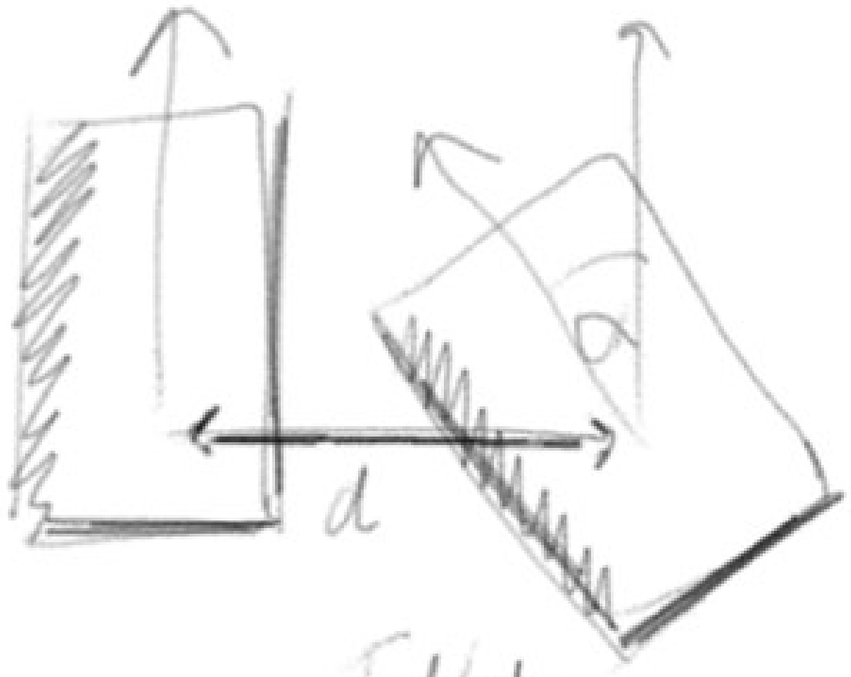

COPY
CUT
FINGER SELECTS
ONE OF 5 CLIPBOARDS

Group Together:

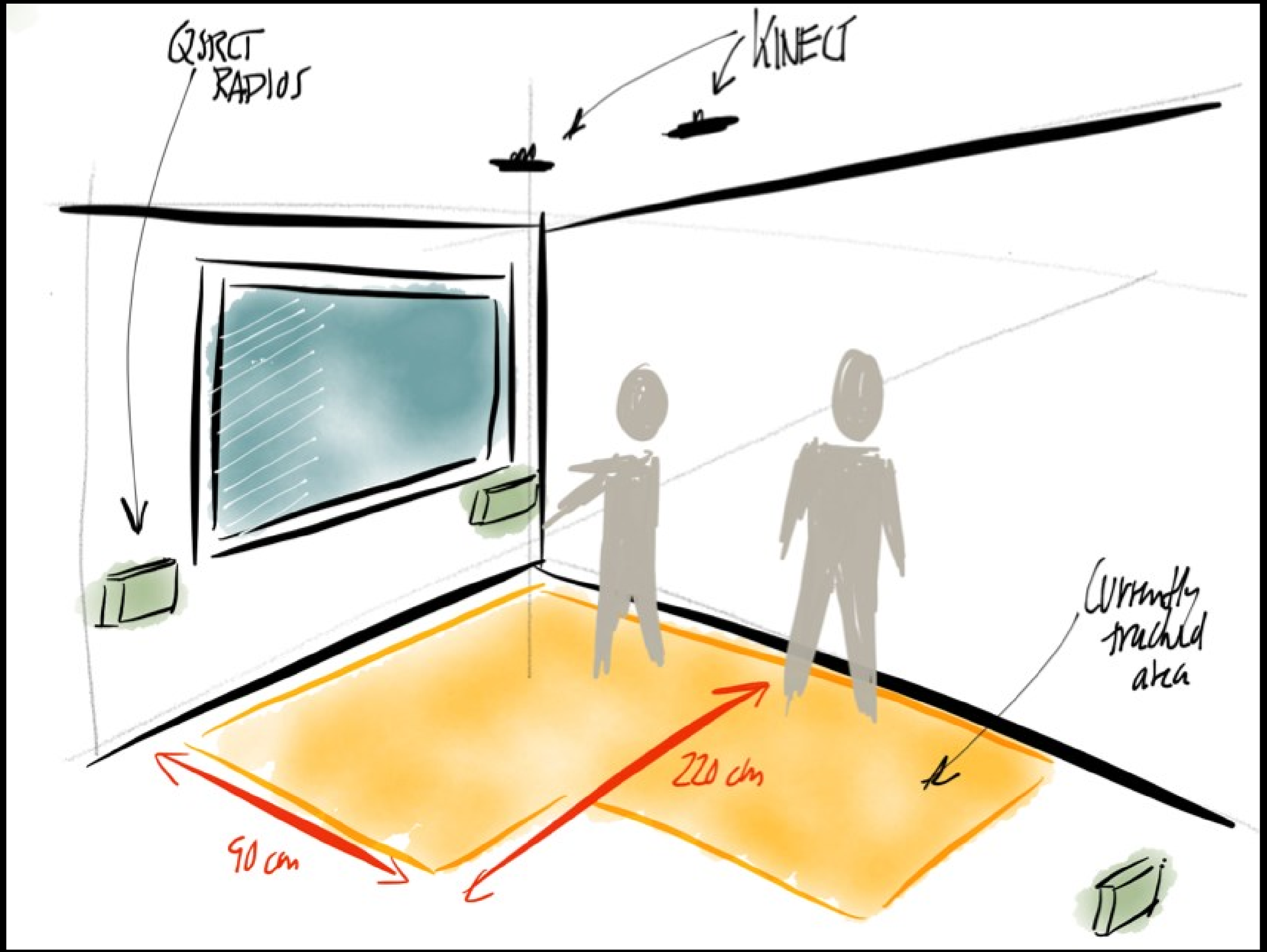
F-formations and micro-mobility

[UIST 2012]





F-FORMATIONS


QSRCT
RADIOS
KINECT
Currently tracked area
220 cm
90 cm

FIGURES MSR PAPER

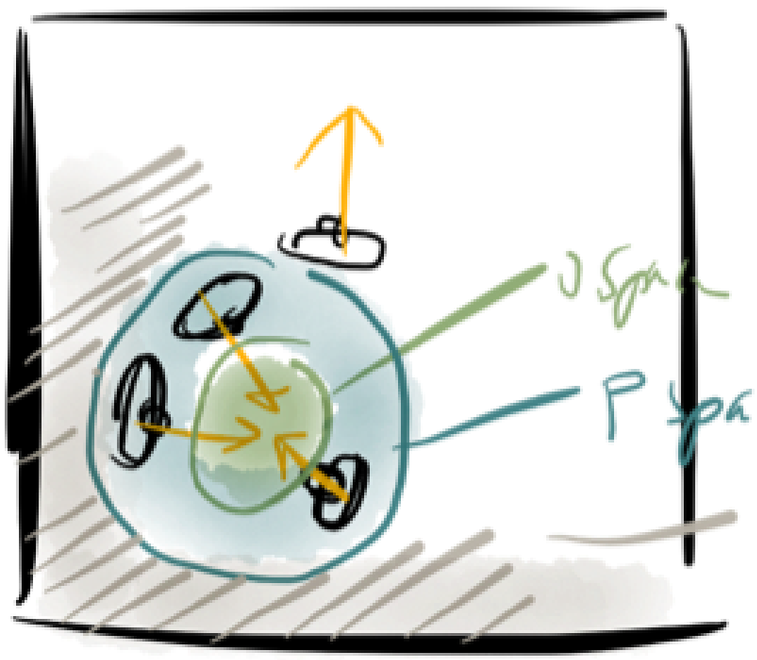


FIGURE 2

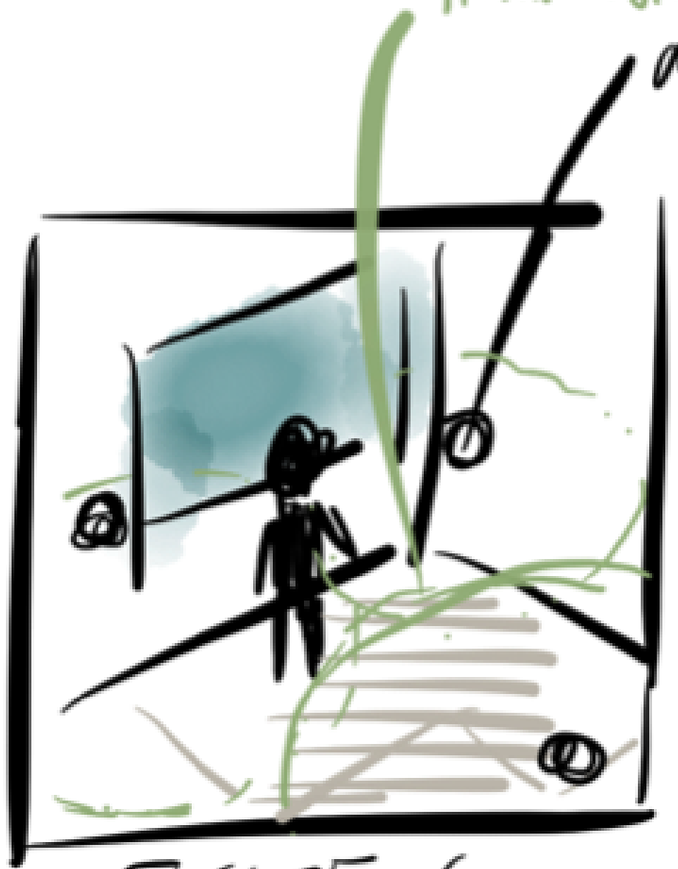


FIGURE 6

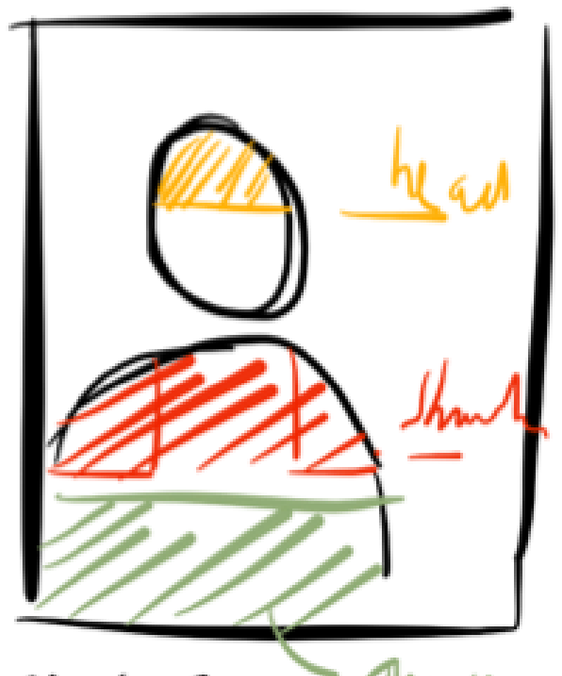


FIGURE 7

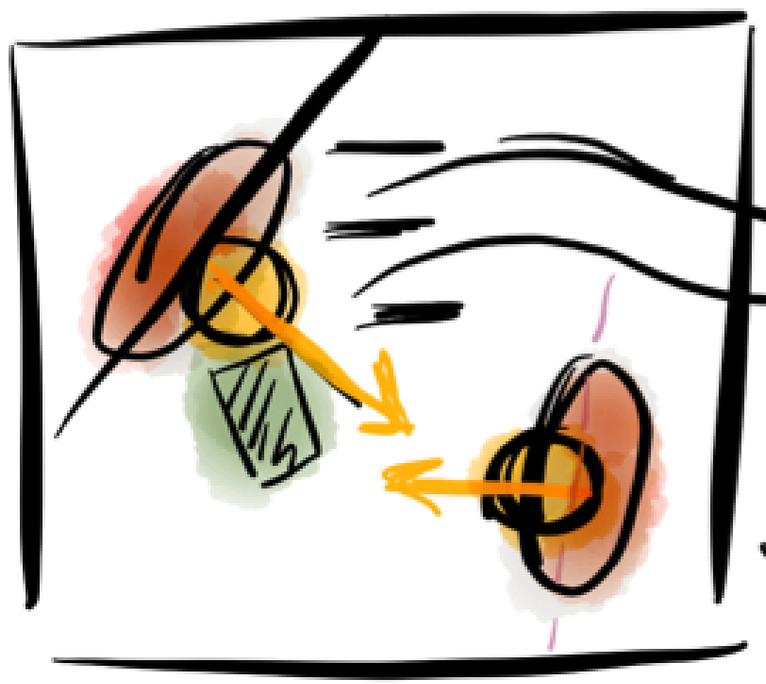


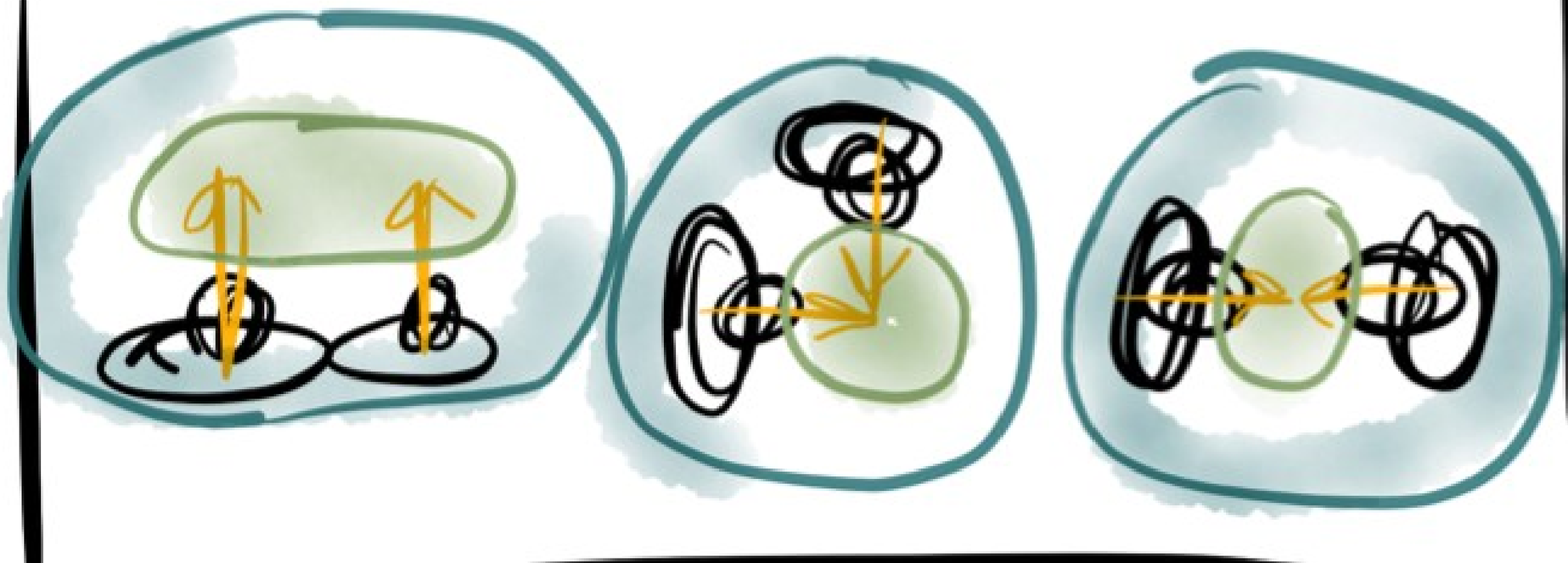
FIGURE 8

Screenshot system

Map to figure 7

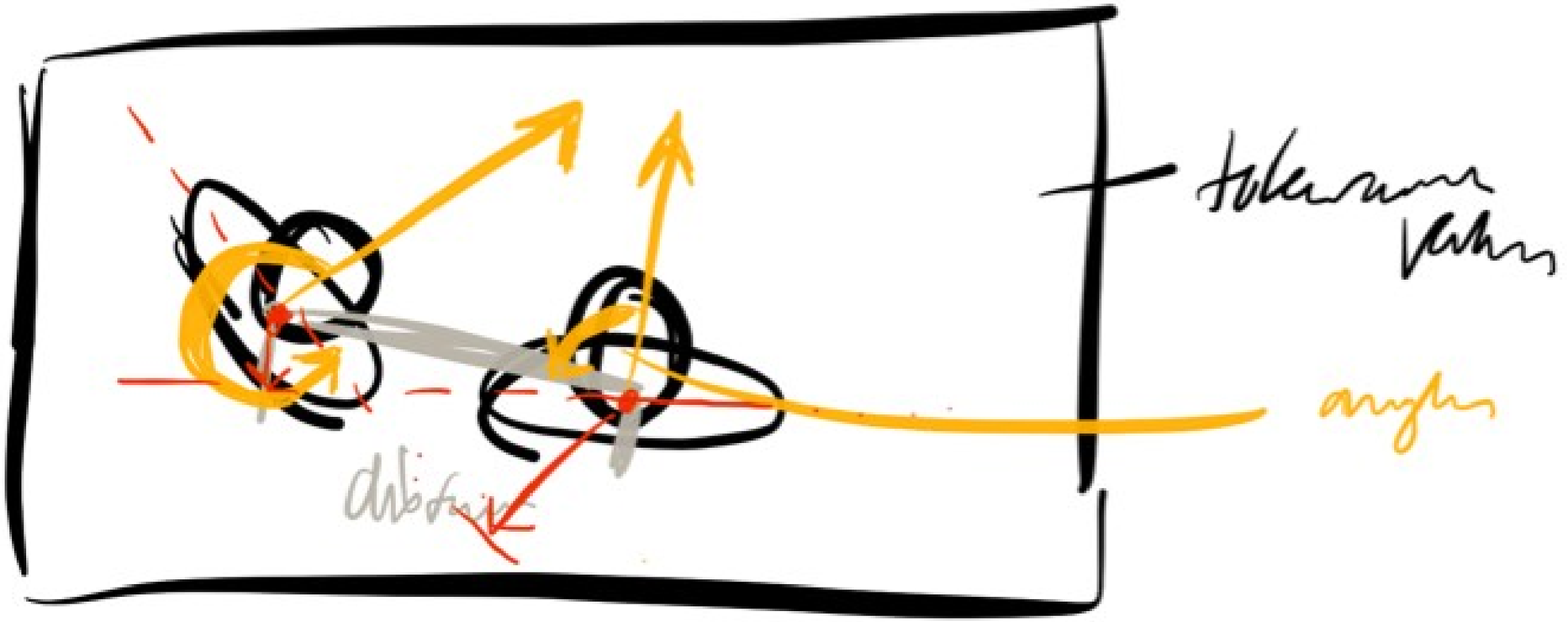
Combine as one figure!

FIGURES MSR PAPER (II)

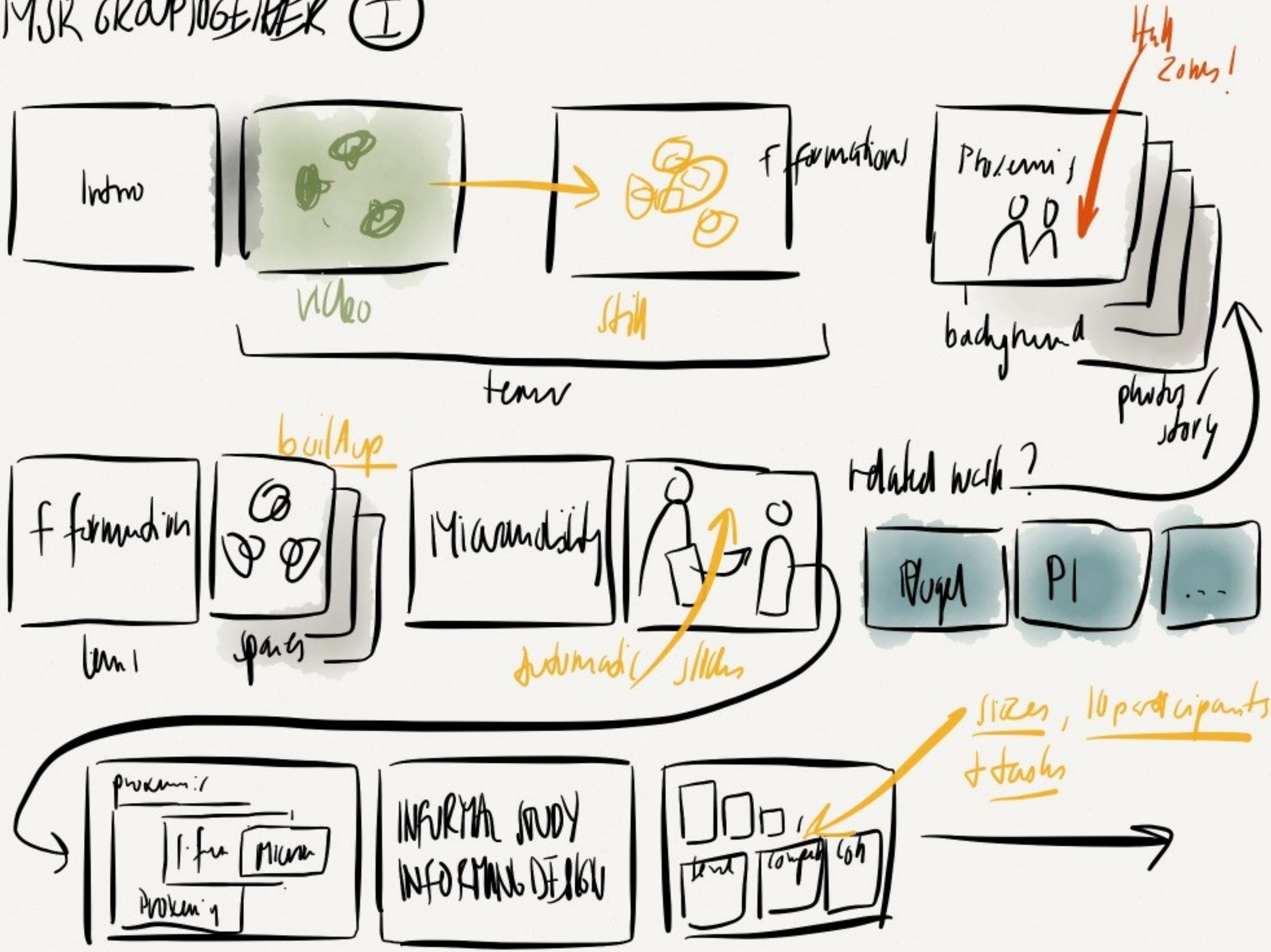


could be part of figure 2 (smaller!)

double formations



MSR GROUP TOGETHER (I)



Observation

01

Informing design

a)
b)
c)

light-weight federation of devices!

- Detect people's formations
- Changes in micro mobility
  allow federation of devices
- More & copy digital content

Consider Proxemics of people + Proxemics of devices

Interface

4 techniques

1)

video

But:
how to detect formation of people & devices?

build up

time/ antiquity/

Ortho

② multiple together

③ segments

Diff Person?

F - formations

proximity people ✓

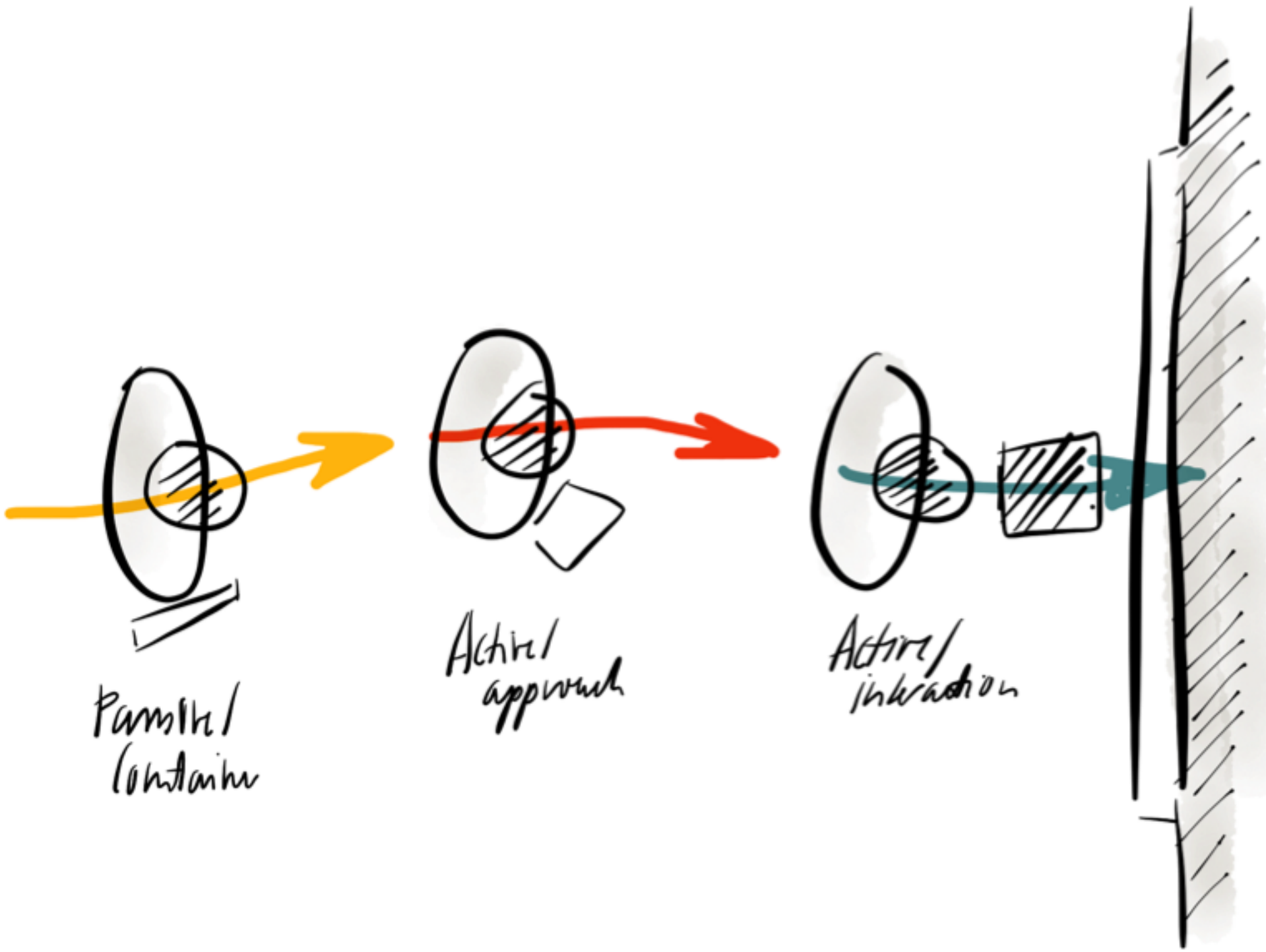
proximity devices ?

+ internal sensing

→ higher mobility

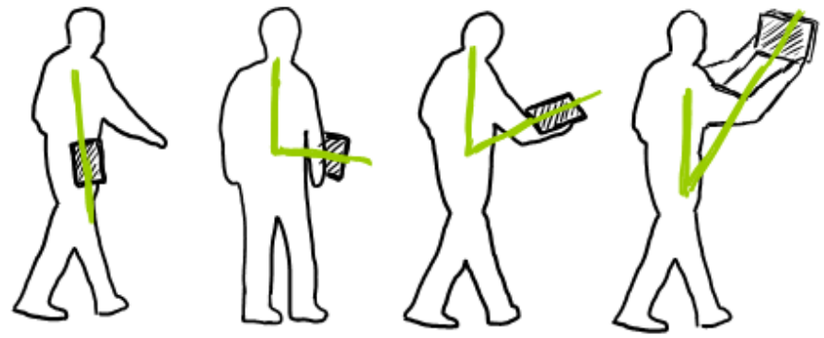
Gradual Engagement

[ITS 2012]

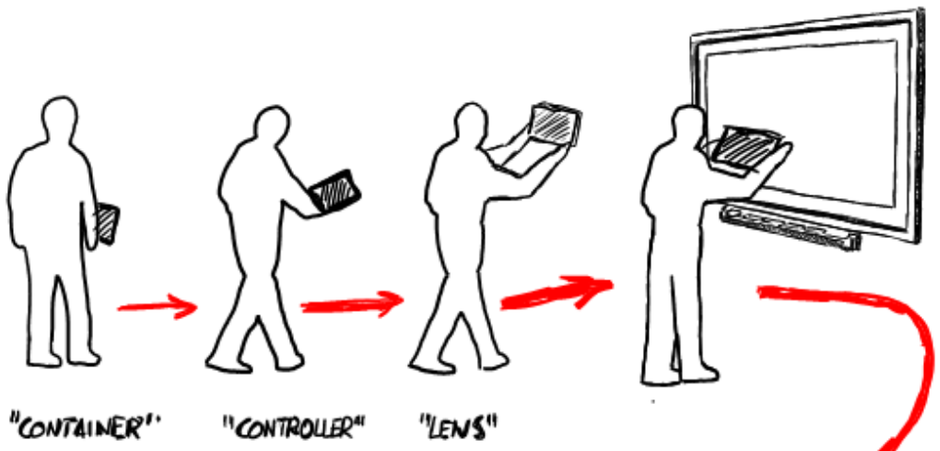

Passive/
Contain
Active/
approach
Active/
interaction

1 DEVICE-TO-PERSON

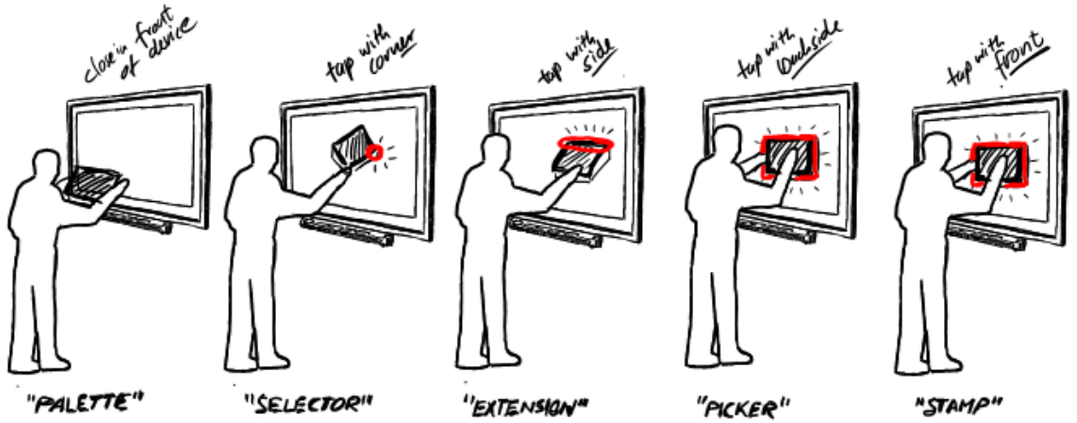
— relative orientation
\+
distance to person



2 DEVICE-TO-DEVICE

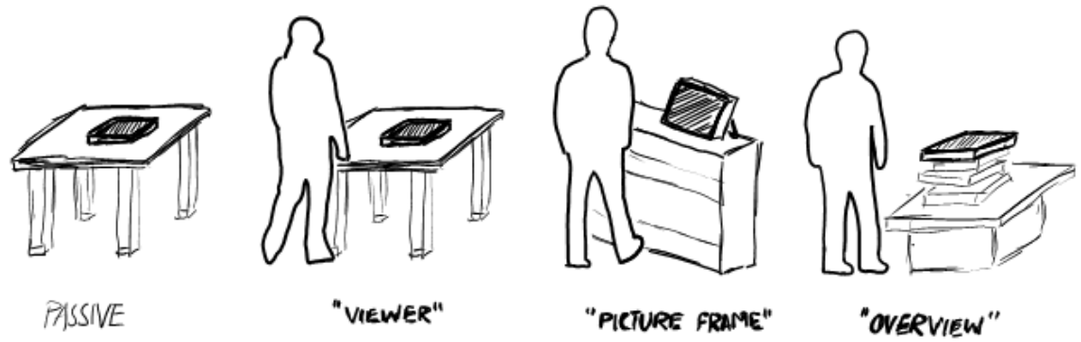


DISTANCE TO DEVICE

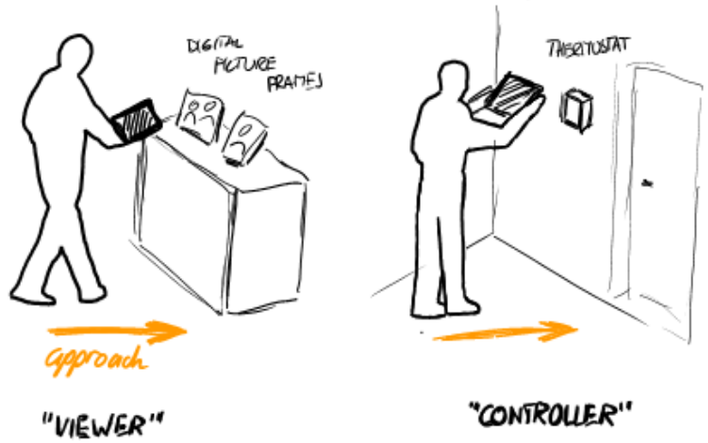


CONTACT AREA / POINT + POSITION / ANGLE

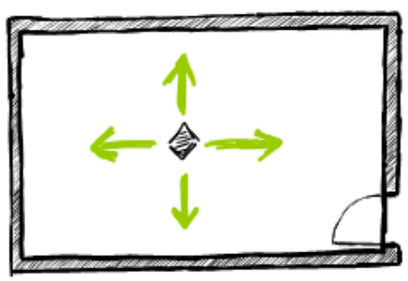
3 DEVICE-TO-NON DIGITAL OBJECTS / FIXED AND SEMIFIXED FEATURE SPACE



4 DEVICE-TO-INFORMATION APPLIANCES
(subset of device-to-device?)



5 DEVICE-TO-FIXED FEATURE/ ENVIRONMENT



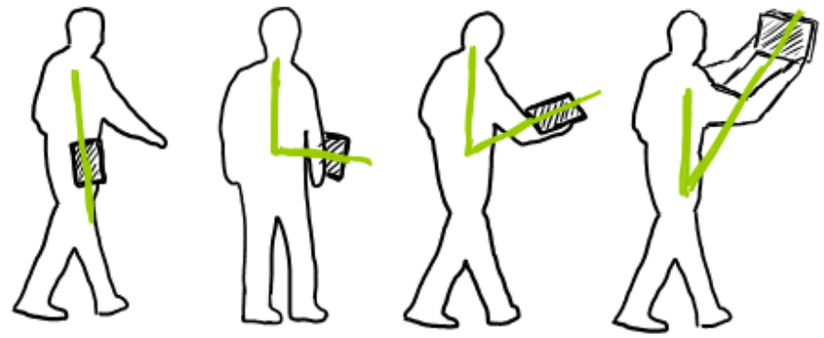
- location & orientation relative to room
- identity of room?

6 DEVICE PROPERTIES

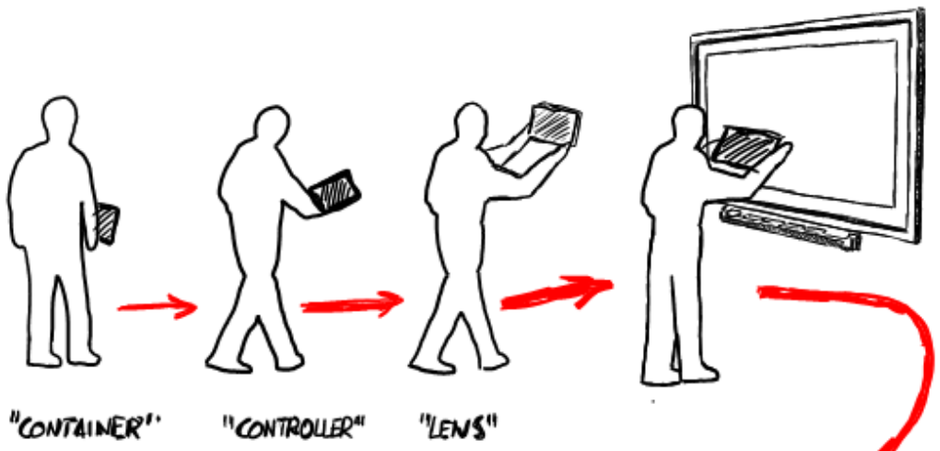
- visible
- activity
- owner
- people around
- global orientation (gyro + age → compass)

1 DEVICE-TO-PERSON

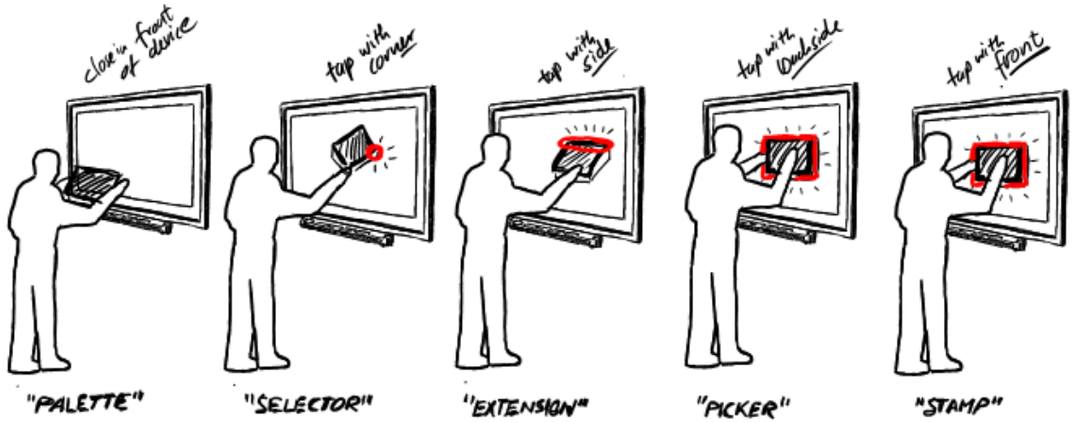
— relative orientation
\+
distance to person



2 DEVICE-TO-DEVICE

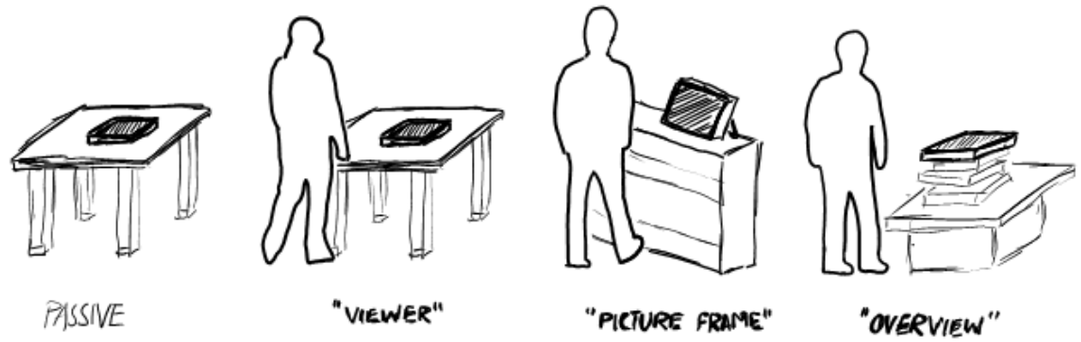


DISTANCE TO DEVICE

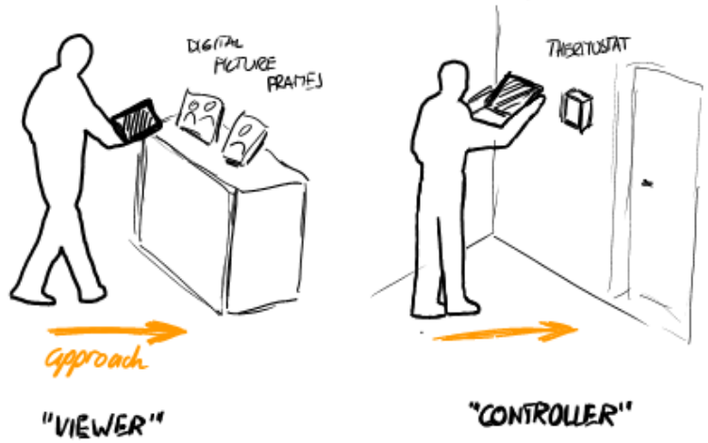


CONTACT AREA / POINT + POSITION / ANGLE

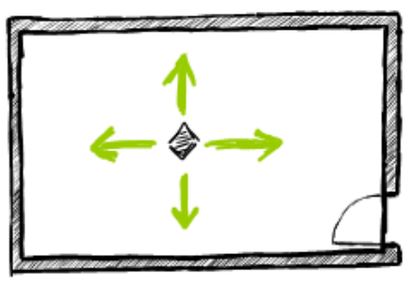
3 DEVICE-TO-NON DIGITAL OBJECTS / FIXED AND SEMIFIXED FEATURE SPACE



4 DEVICE-TO-INFORMATION APPLIANCES
(subset of device-to-device?)



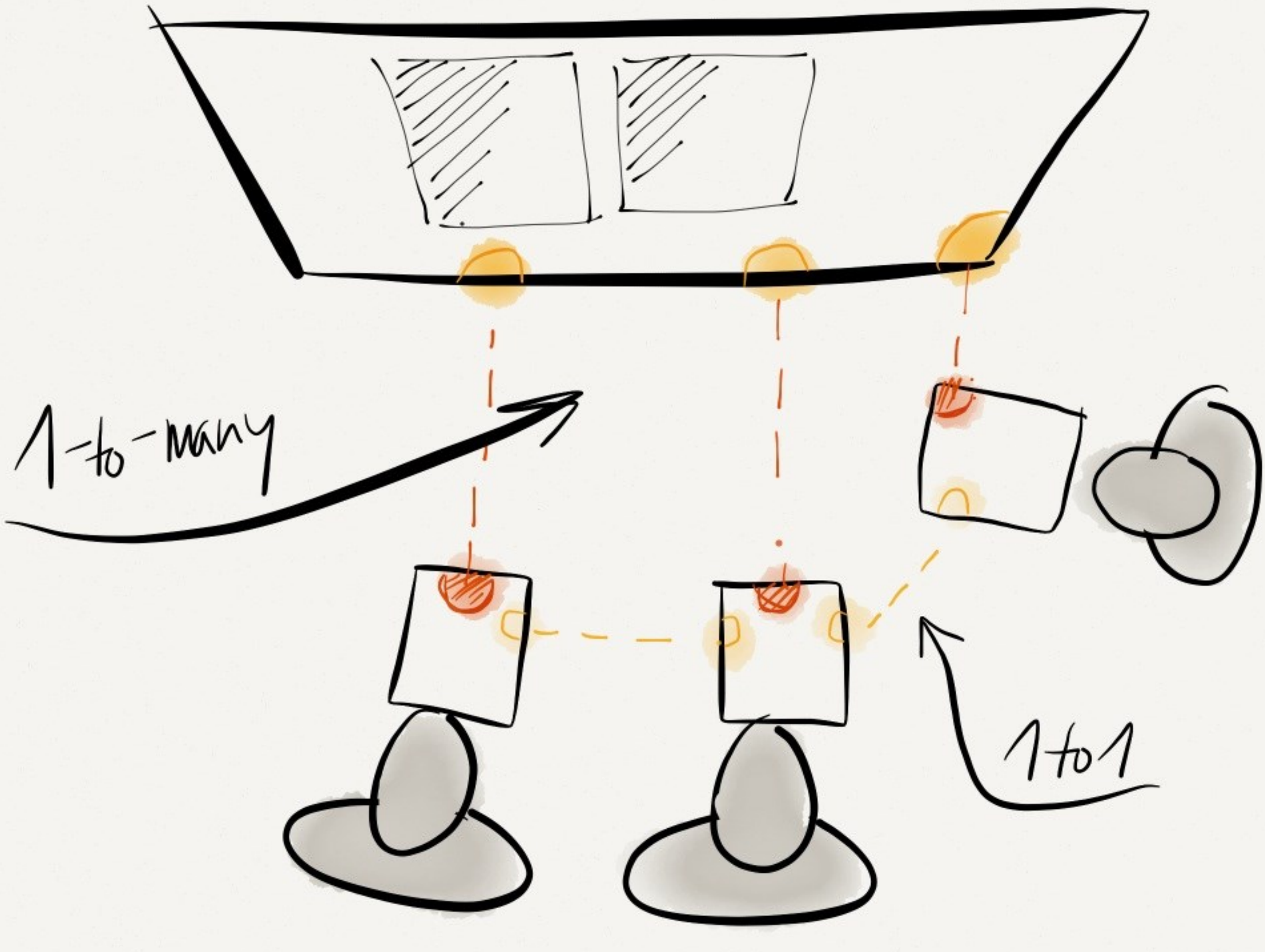
5 DEVICE-TO-FIXED FEATURE/ ENVIRONMENT



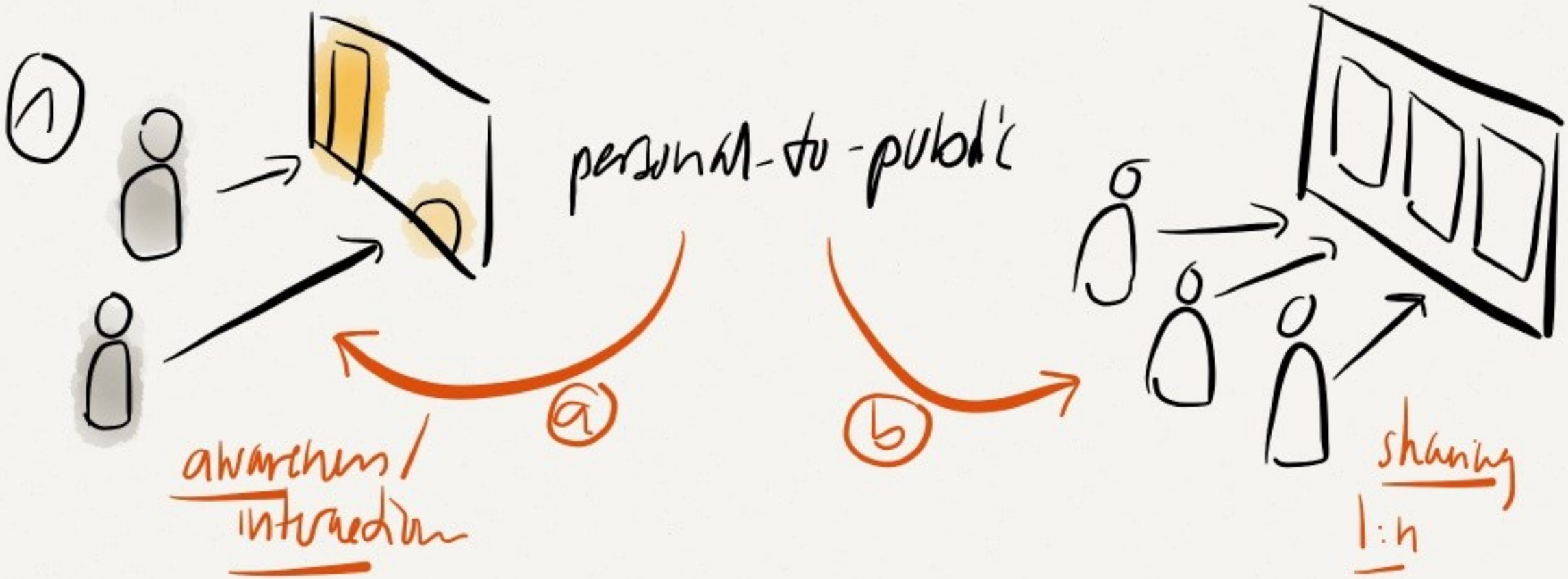
- location & orientation relative to room
- identity of room?

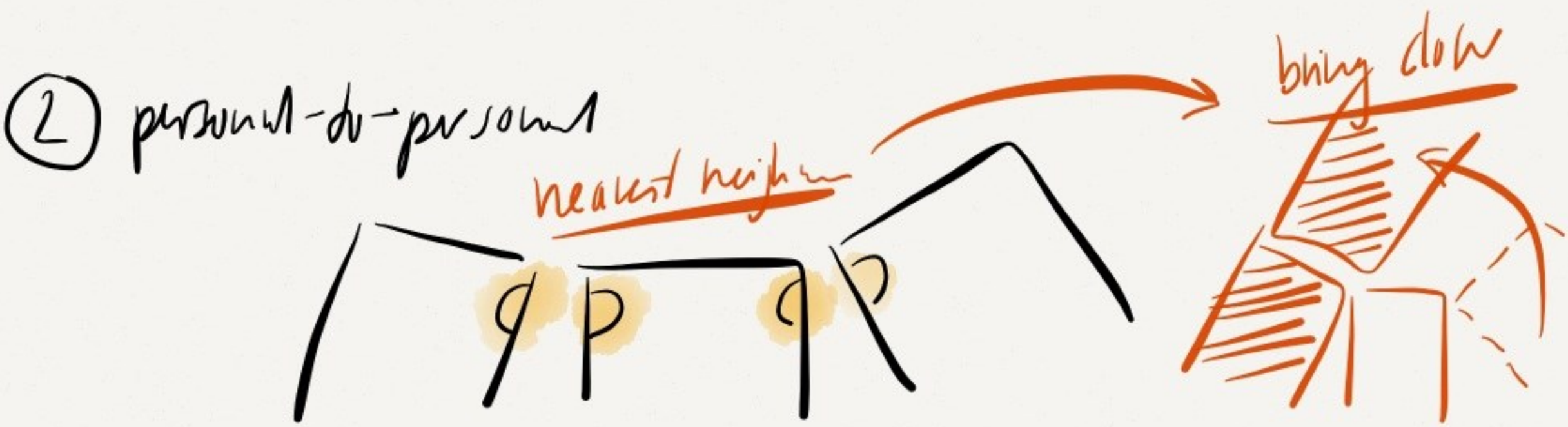
6 DEVICE PROPERTIES

- visible
- activity
- owner
- people around
- global orientation (gyro + age → compass)


1-to-many
1to1

1-to-many relationships





STAGE I

AWARENESS OF DEVICE PRESENCE AND CONNECTIVITY

- PROXEMIC RELATIONSHIPS
  - LOCATION
  - DISTANCE
  - MOVEMENT
  - ORIENTATION
  - IDENTITY
- NOTIFICATIONS ABOUT DEVICE PRESENCE & CONNECTIVITY

STAGE II

CONTENT AWARENESS

- REVEALING CONTENT PERSONAL VS. PUBLIC
- PROXIMITY-DEPEND. PROGRESSIVE-REVEAL
- IMPLICIT vs. EXPLICIT REVEAL

STAGE III

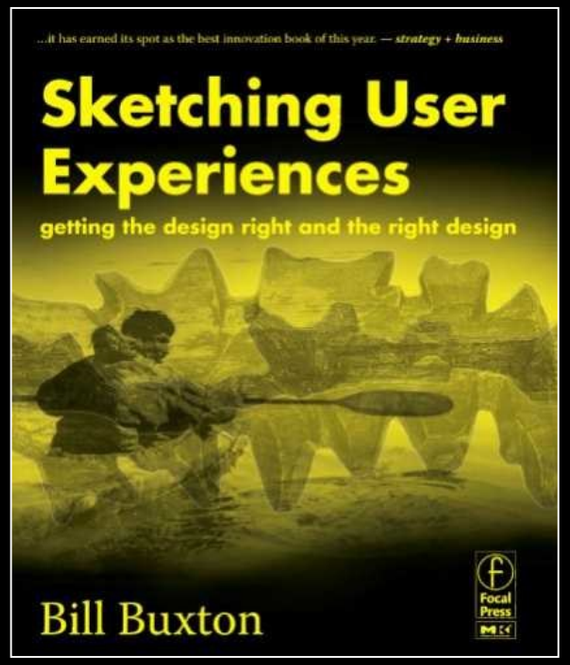
TRANSFERRING DIGITAL CONTENT BETWEEN DEVICES

SINGLE PERSON | MULTIPLE PEOPLE

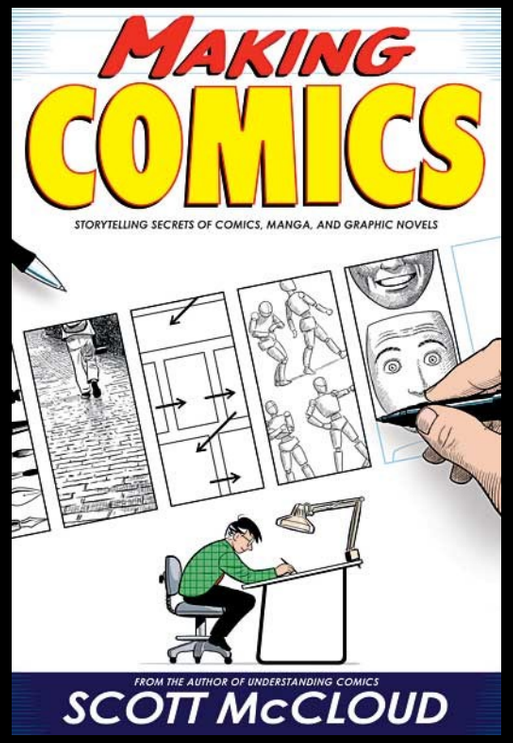
- DRAG & BACK
- POINT-TO-PIN
- POINT/SELECT/EDIT
- PORTALS
- DRAG IN & OUT
- POINT/TOUCH/EDIT

- COLLABORATIVE HANDOFF
- DRAG BETWEEN PUBLIC INTERMEDIARY

Learning more...


...it has earned its spot as the best innovation book of this year. — strategy + business
Sketching User Experiences
getting the design right and the right design
Bill Buxton
Focal Press


Sketching
USER EXPERIENCES
The Workbook
Saul Greenberg
Sheelagh Carpendale
Nicolai Marquardt
Bill Buxton
MK


MAKING
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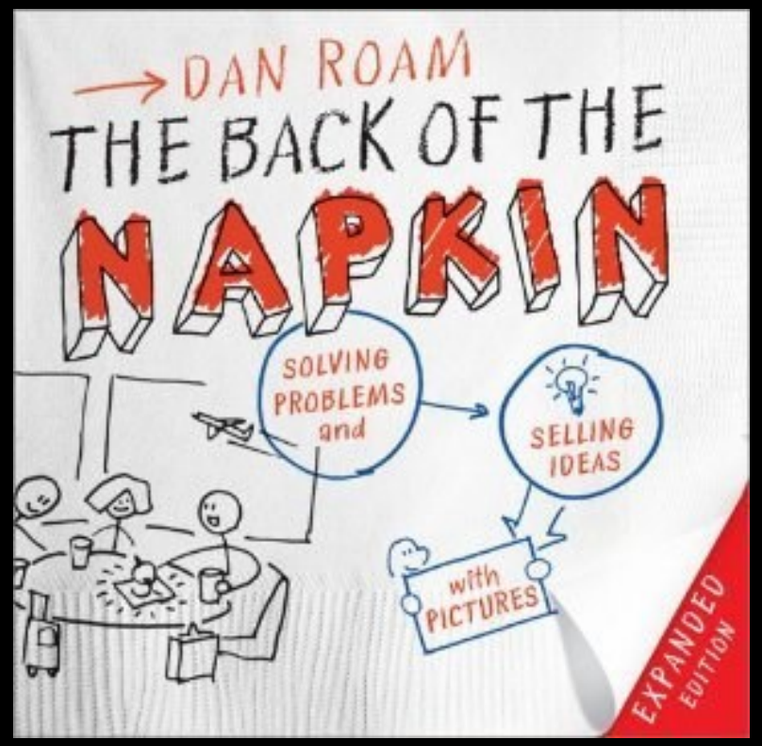
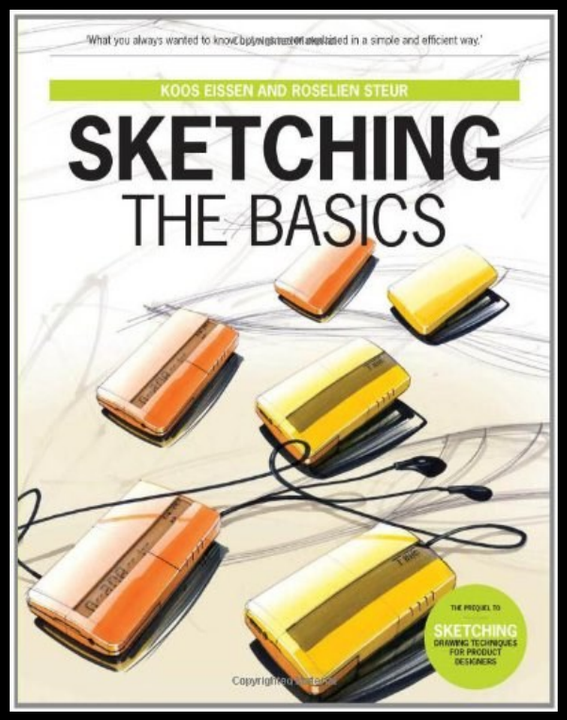
STORYTELLING SECRETS OF COMICS, MANGA, AND GRAPHIC NOVELS
FROM THE AUTHOR OF UNDERSTANDING COMICS
SCOTT McCLOUD


DAN ROAM
THE BACK OF THE
NAPKIN
SOLVING PROBLEMS and
SELLING IDEAS
with PICTURES
EXPANDED EDITION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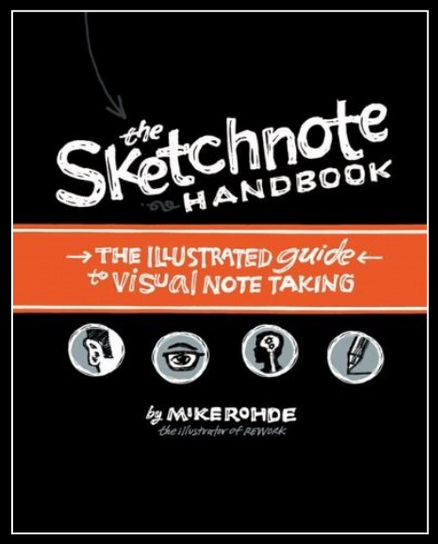
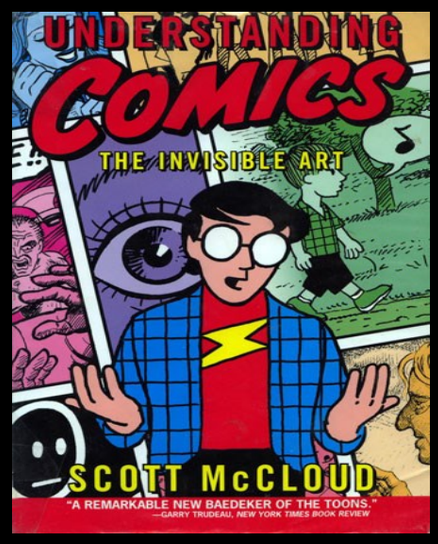
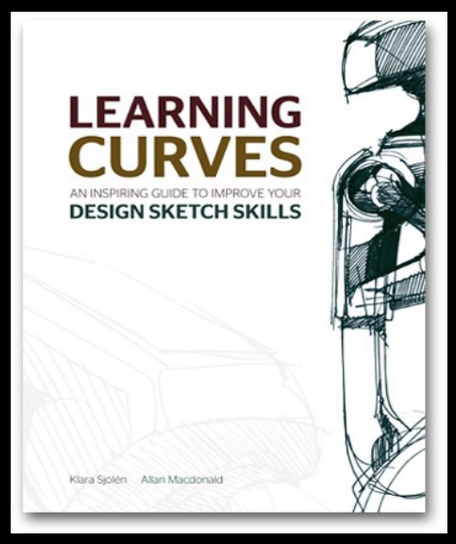
SKETCHING
THE BASICS
THE PREQUEL TO
SKETCHING
DRAWING TECHNIQUES FOR PRODUCT DESIGNERS


the Sketchnote HANDBOOK
THE ILLUSTRATED guide to VISUAL NOTE TAKING
by MIKE ROHDE
the illustrator of REWORK


UNDERSTANDING
COMICS
THE INVISIBLE ART
SCOTT McCLOUD
"A REMARKABLE NEW BAEDEKER OF THE TOONS."
—GARRY TRUDEAU, NEW YORK TIMES BOOK REVIEW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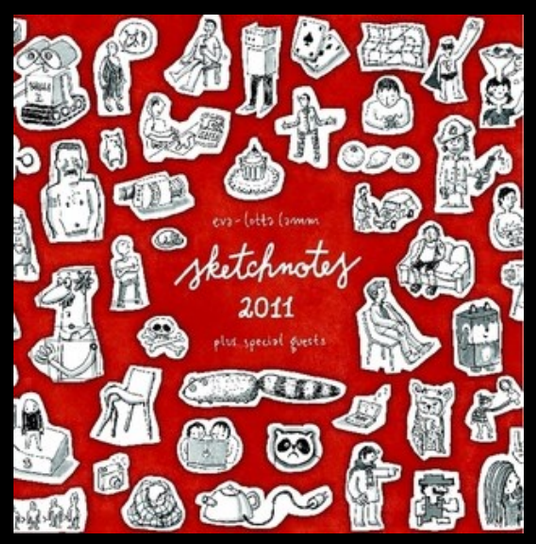
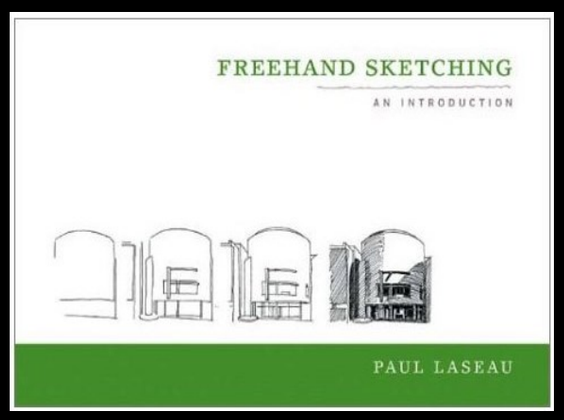
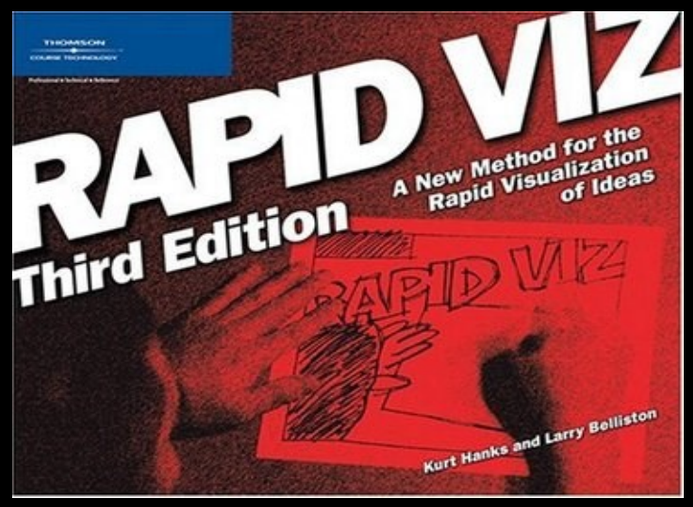
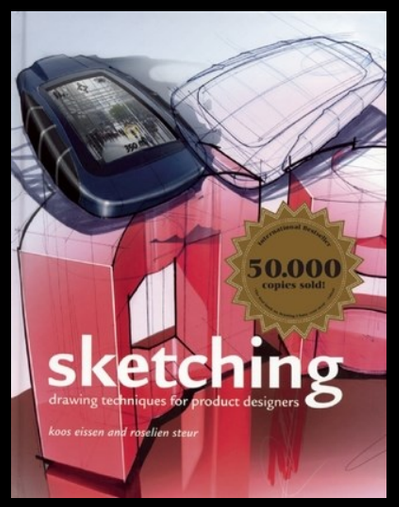
Klara Sjölén Allan Macdonald


sketchnotes
2011
plus special guests


FREEHAND SKETCHING
AN INTRODUCTION
PAUL LASEAU


RAPID VIZ
Third Edition
A New Method for the Rapid Visualization of Ideas
Kurt Hanks and Larry Belliston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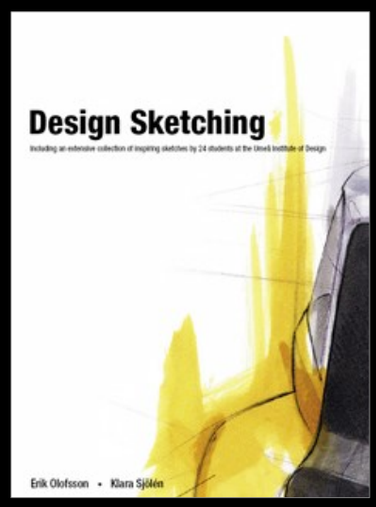
Design Sketching
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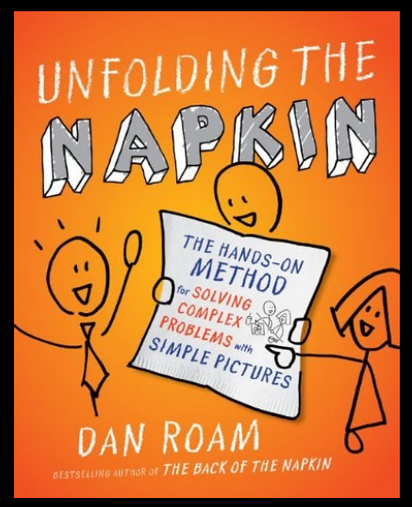
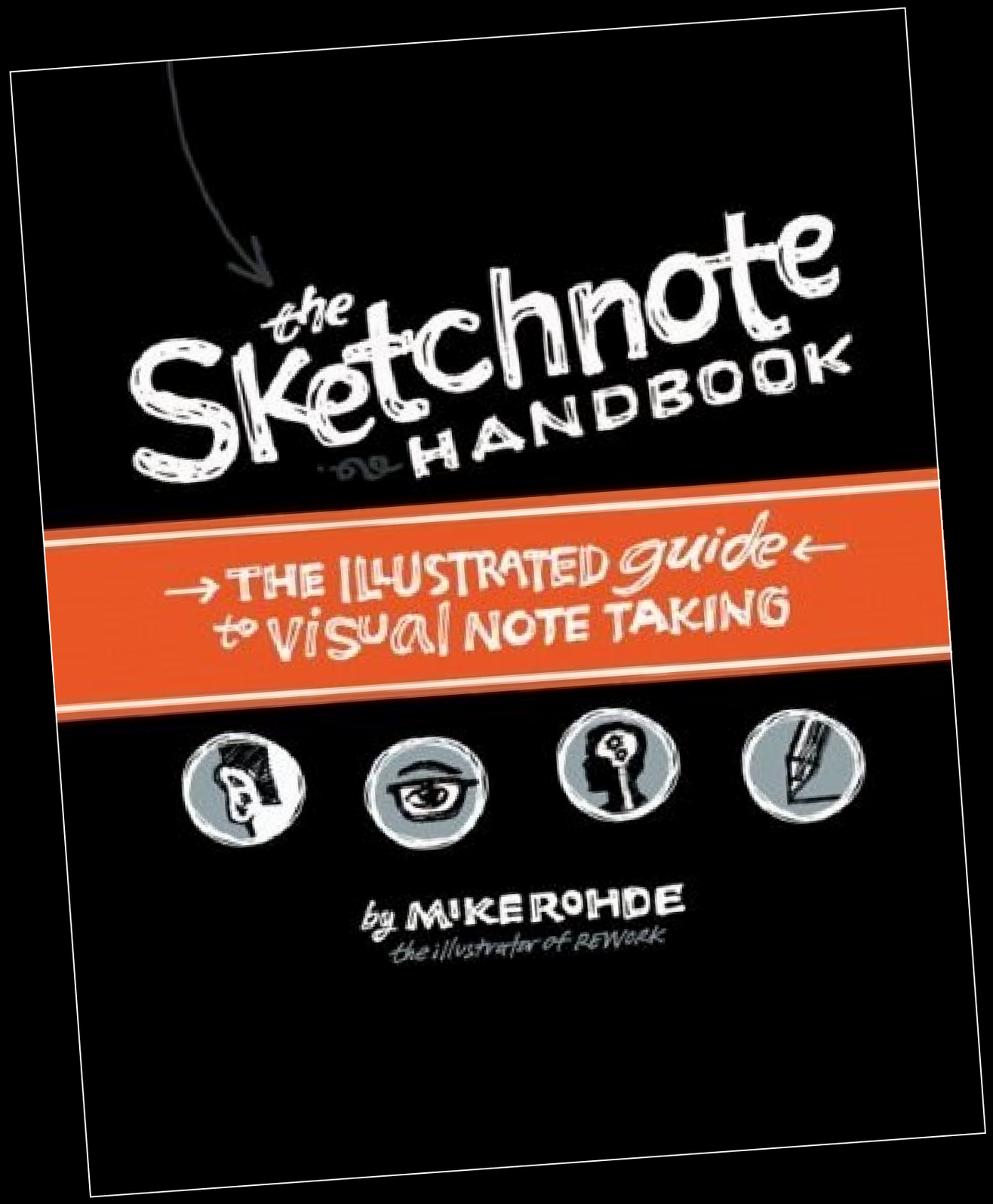
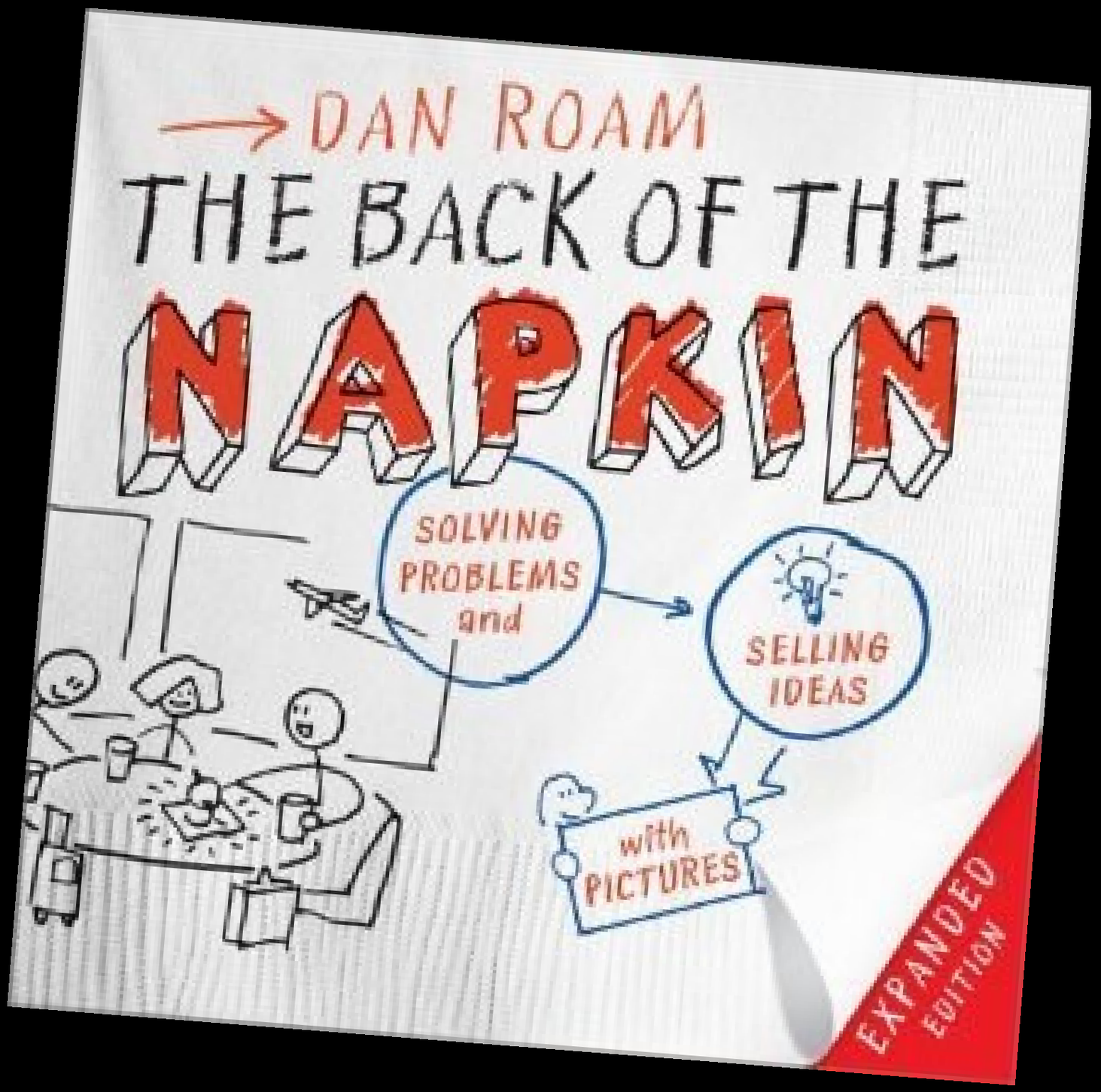

UNFOLDING THE
NAPKIN
THE HANDS-ON METHOD for SOLVING COMPLEX PROBLEMS with SIMPLE PICTURES
DAN ROAM
BESTSELLING AUTHOR OF THE BACK OF THE NAPKIN

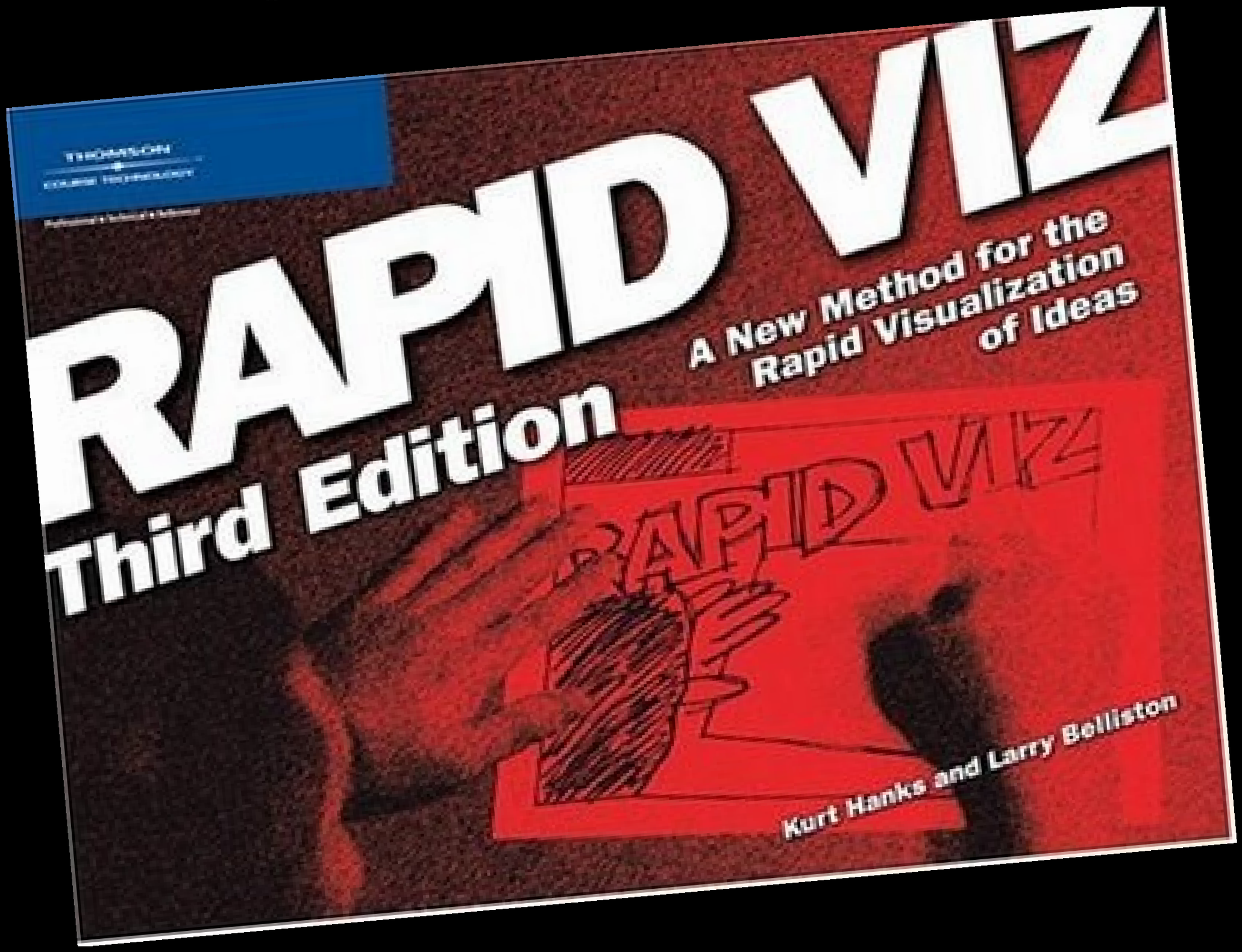
....sketching as everyday habit



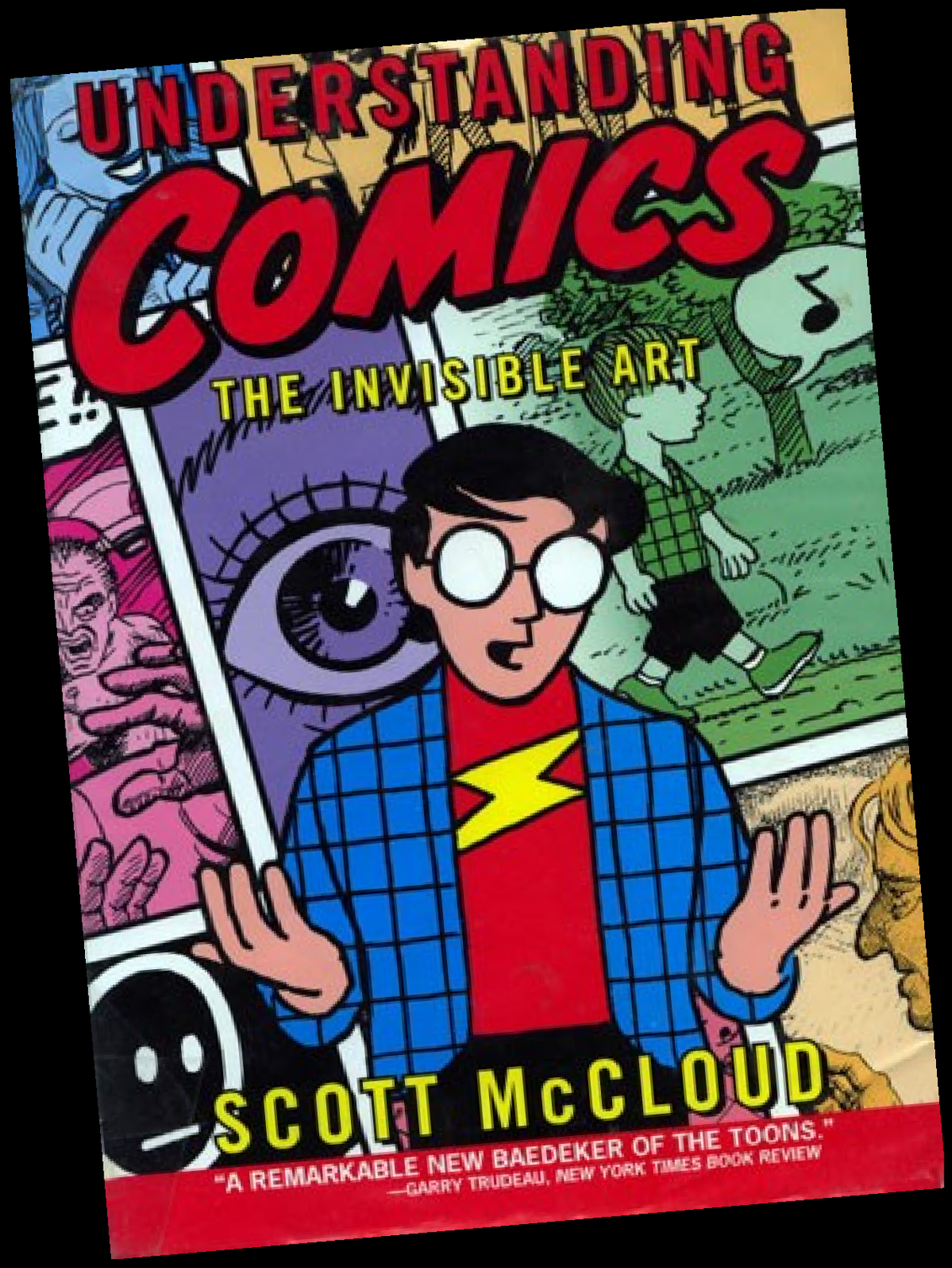
...problem solving with simple sketches



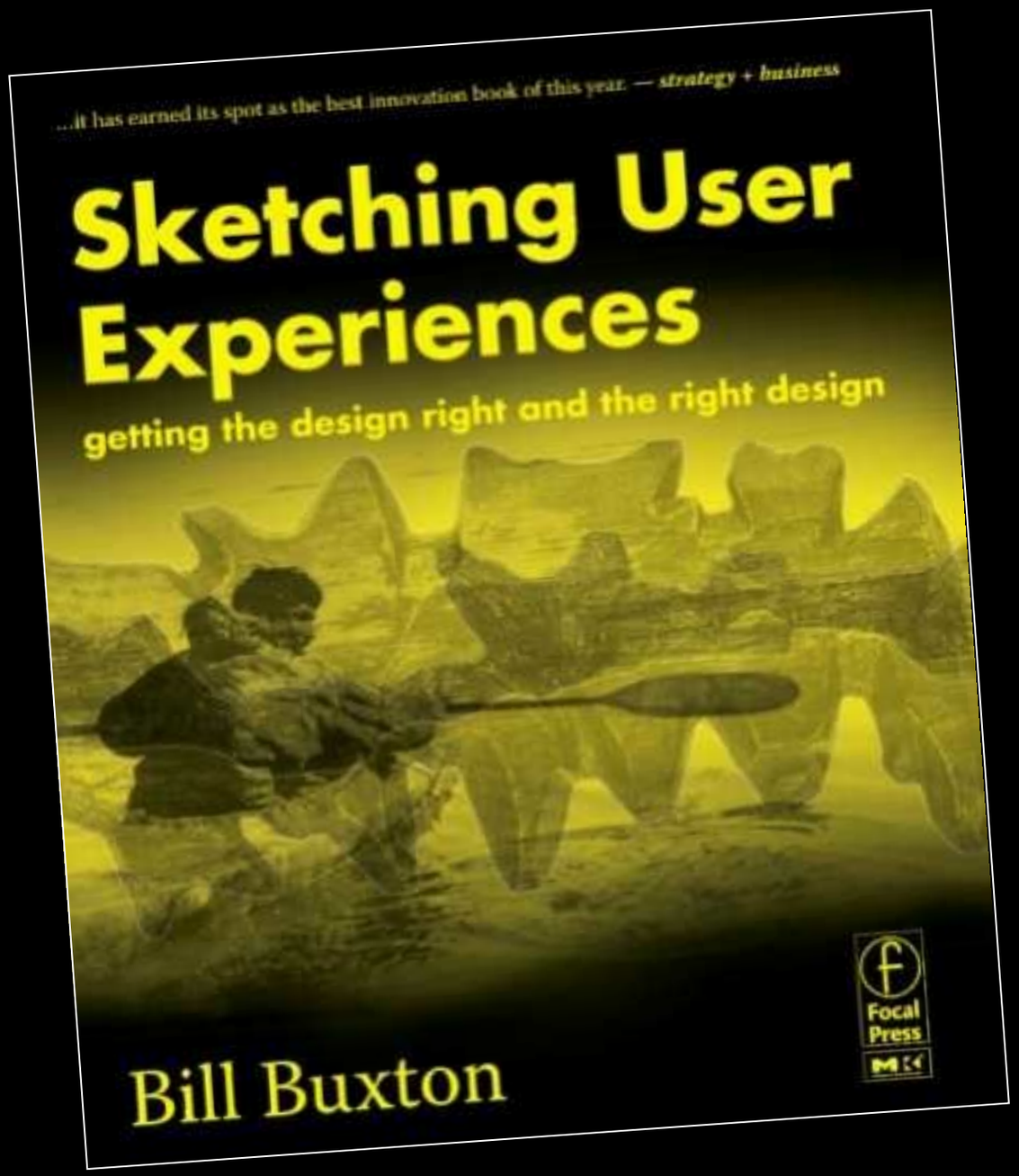
....sketching ideas

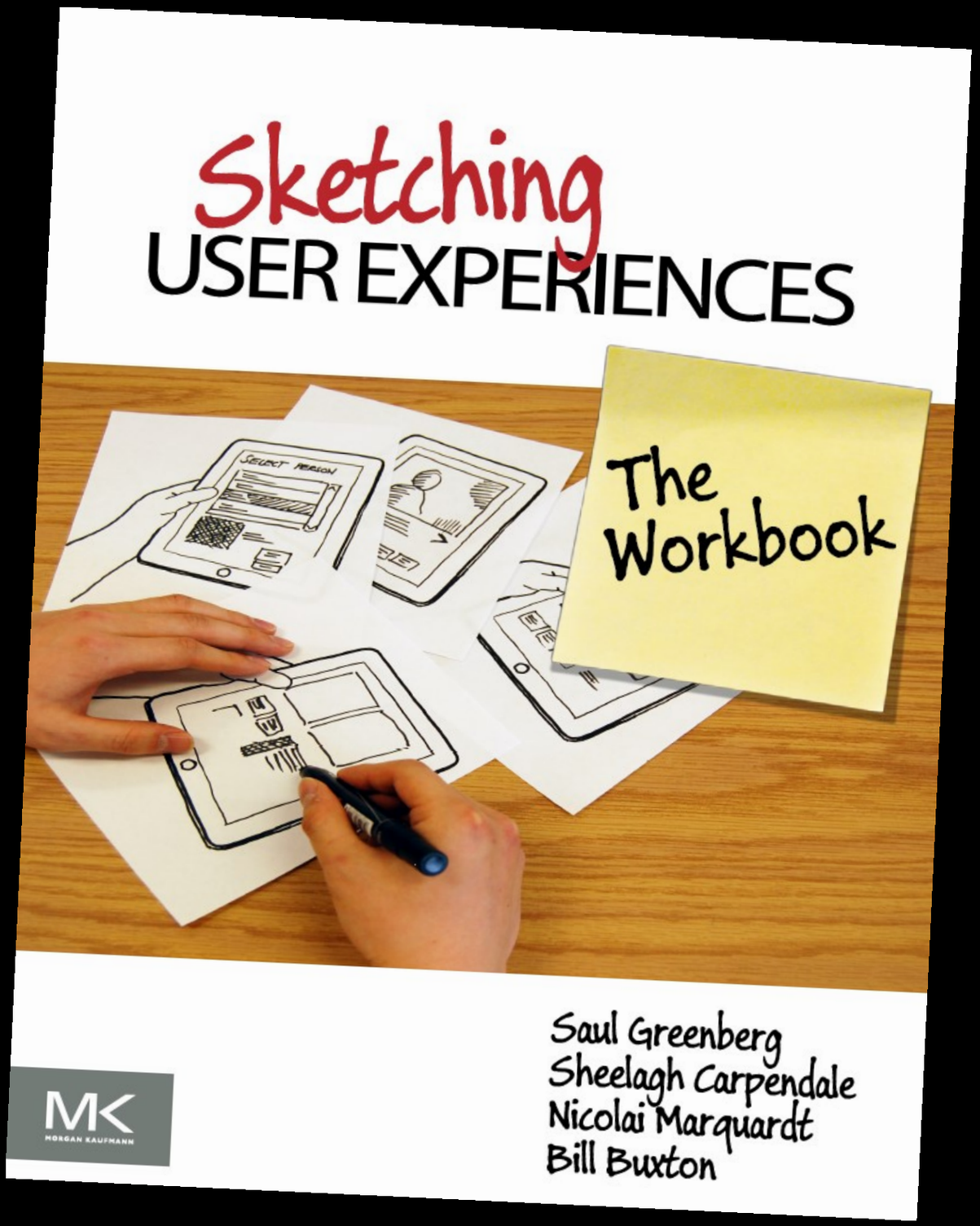


...visual storytelling



....sketching user experiences





Sketching workbook website:

http://saul.cpsc.ucalgary.ca/sketchbook/

References:

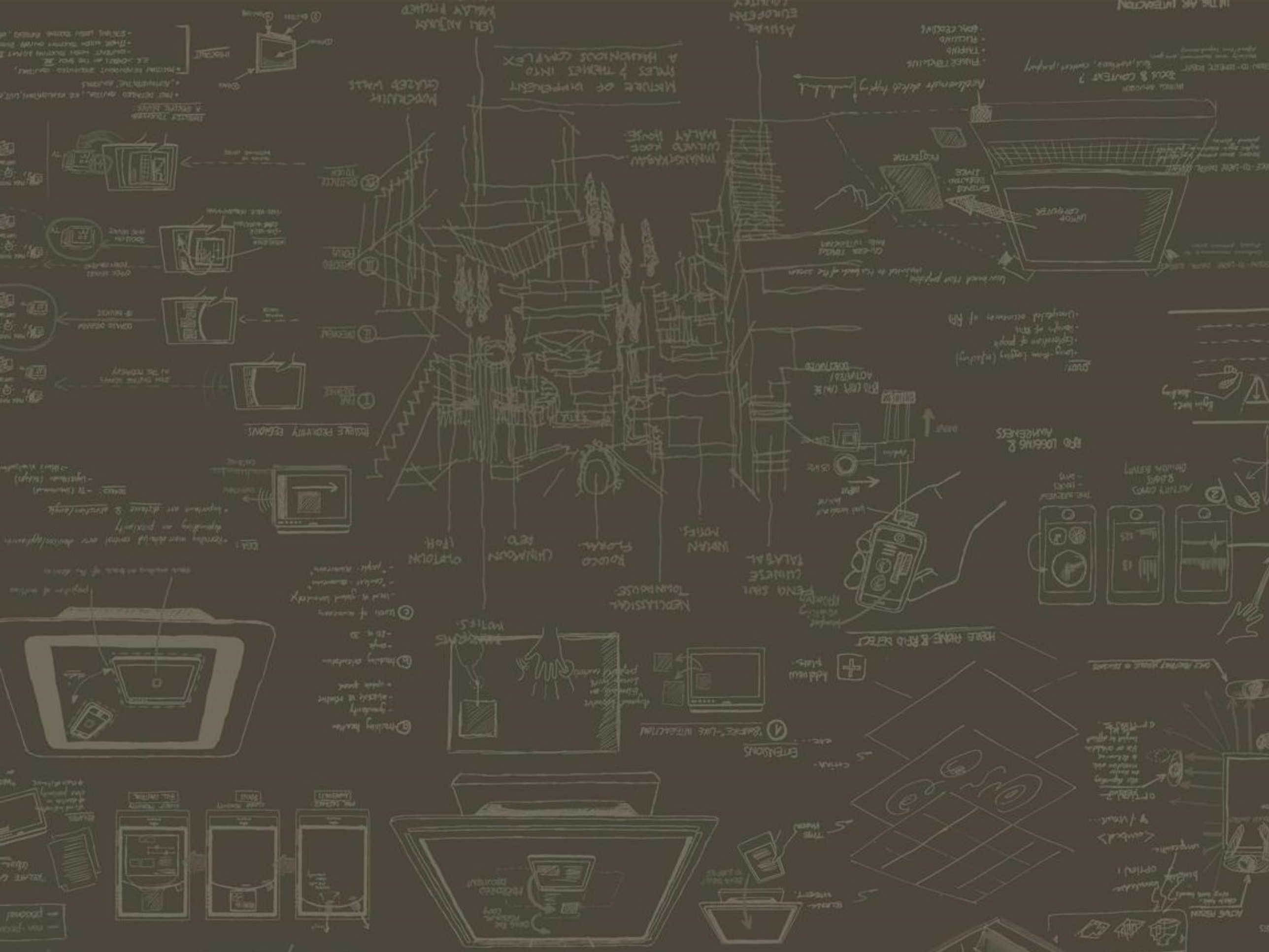
[1] Buxton, W. Sketching User Experiences, Morgan Kaufmann 2007.

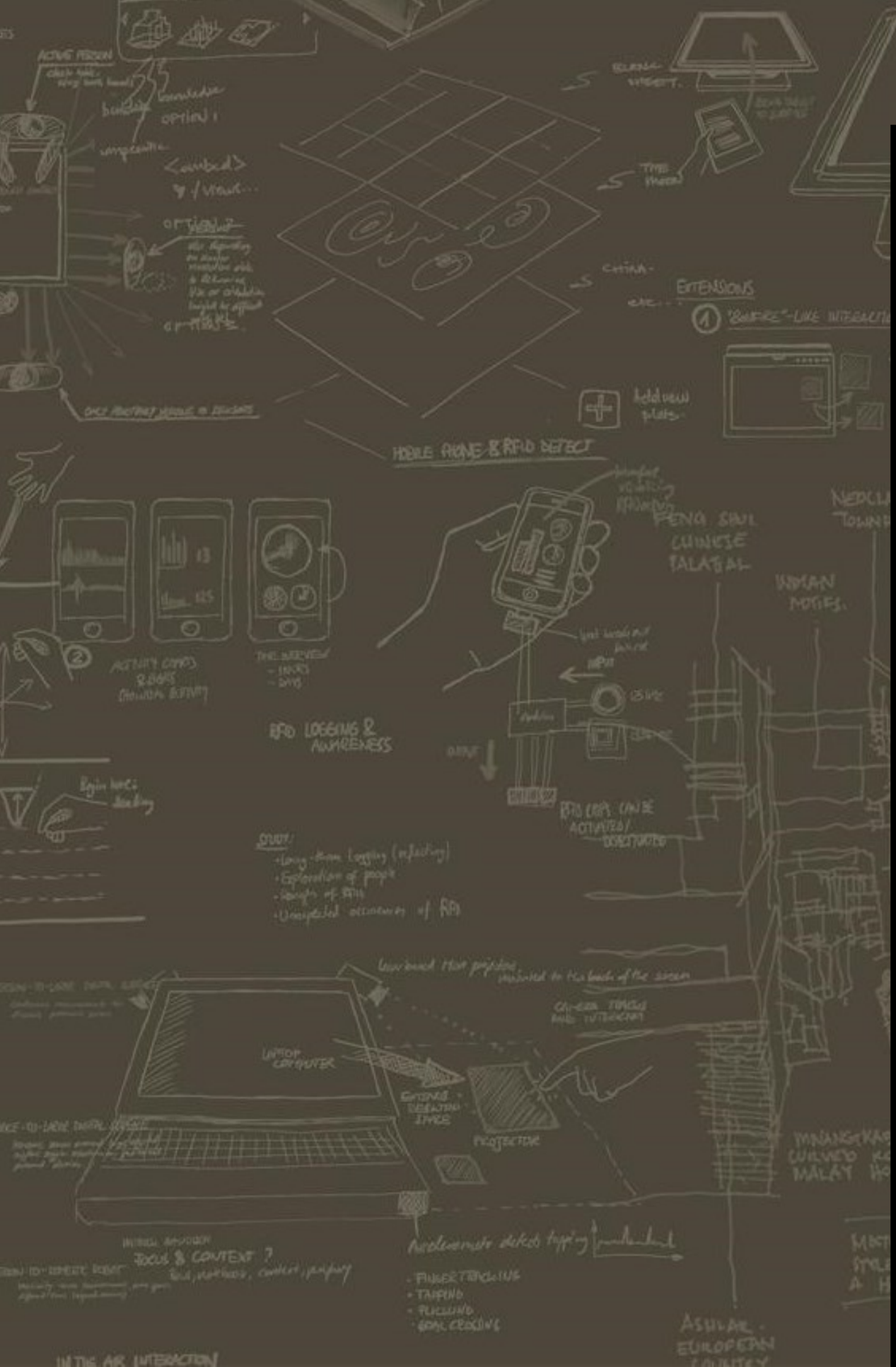
[2] Greenberg, S., Carpendale, S., Marquardt, N., Buxton, B.
Sketching User Experiences: The Workbook. Morgan Kaufmann, 2012.

[3] Stevens, G. UX Lecture Series University of Siegen 2010.

[4] Snyder, C. Paper Prototyping, Morgan Kaufmann 2003.

[5] Canemaker, J. Paper Dreams: The Art And Artists Of Disney Storyboards, Disney Editions 1999.





SKETCHING USER EXPERIENCES

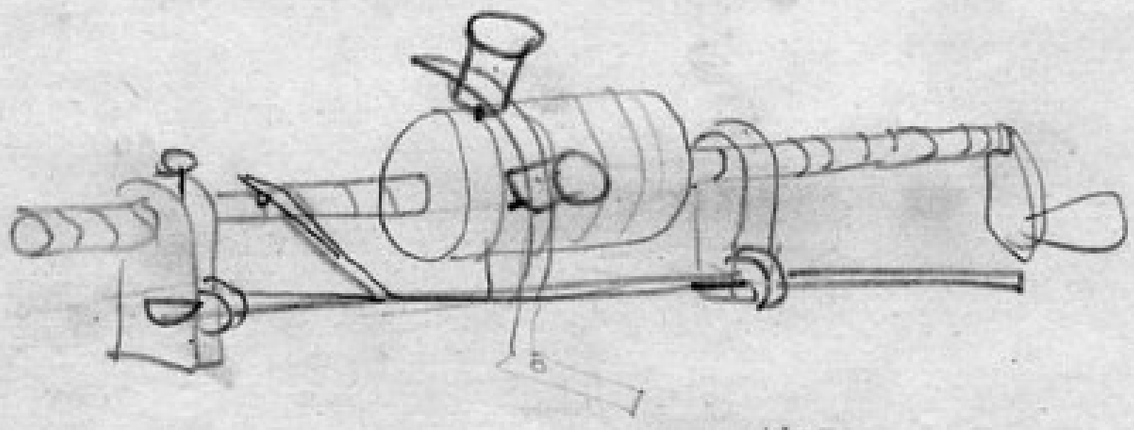
STORIES
STRATEGIES
SURFACES

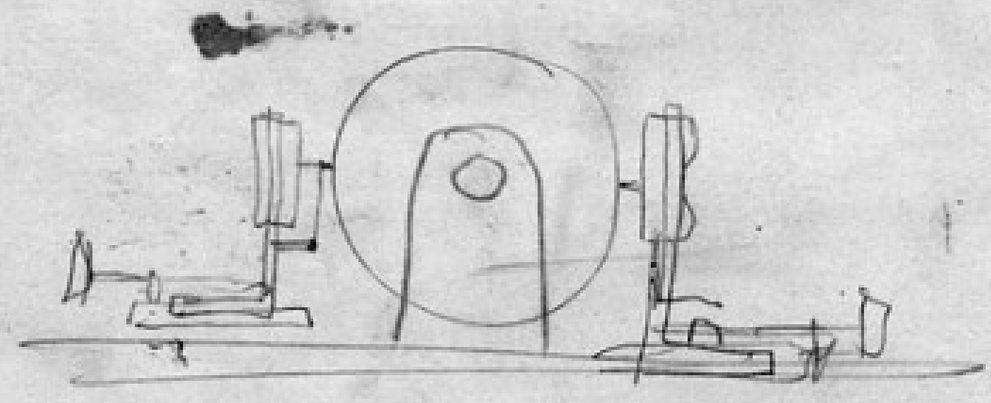
Phonograph
1877
Edison Lab

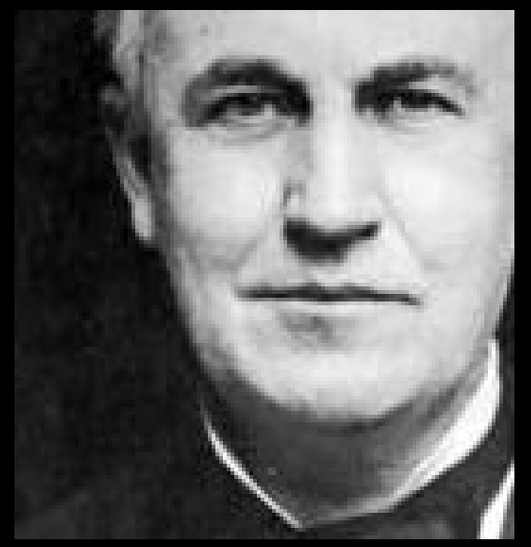
582

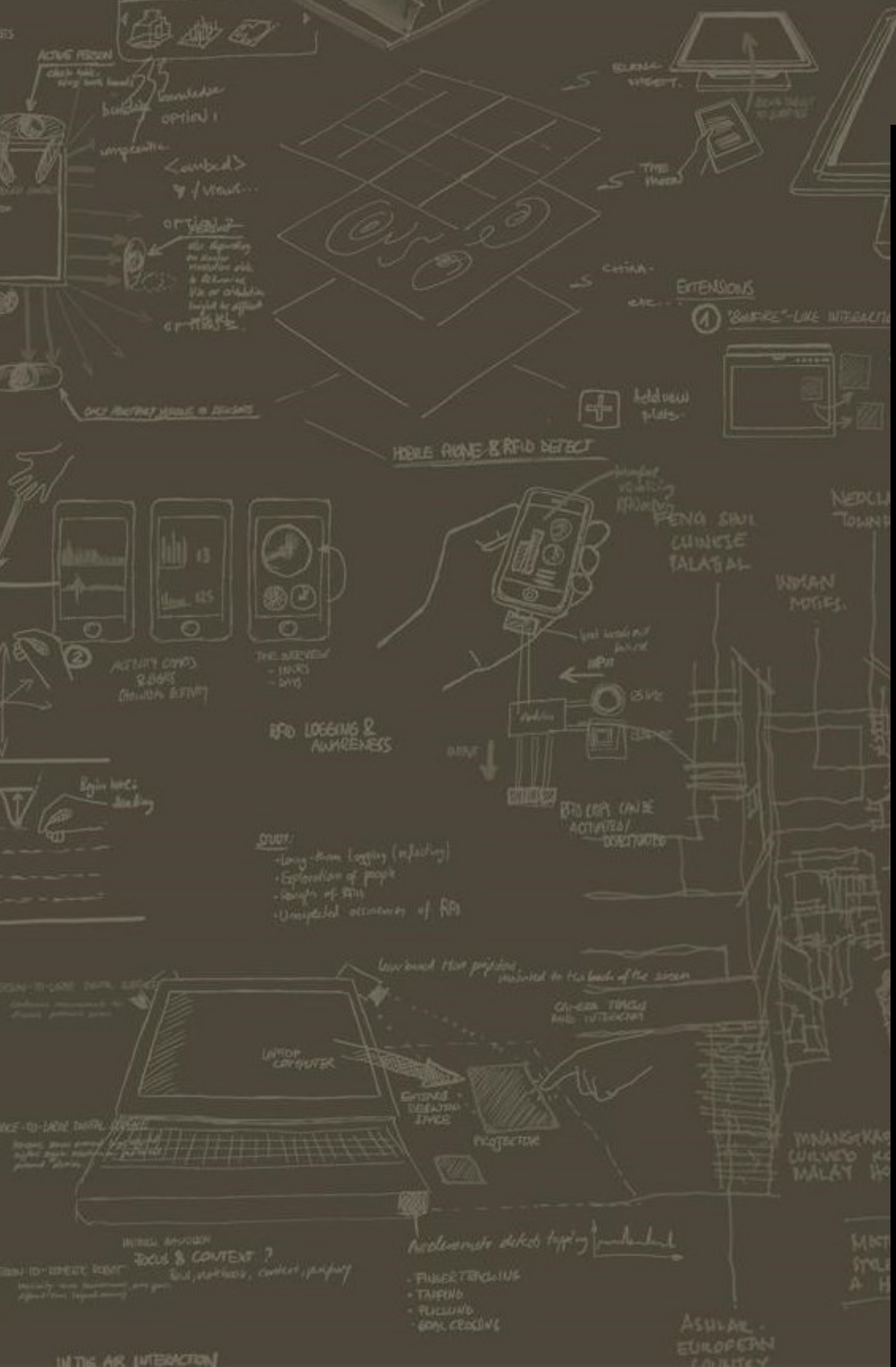
Phonograph.

Nov 20th 1877
T A Edison
Chas Batchelor
J Kruesi.

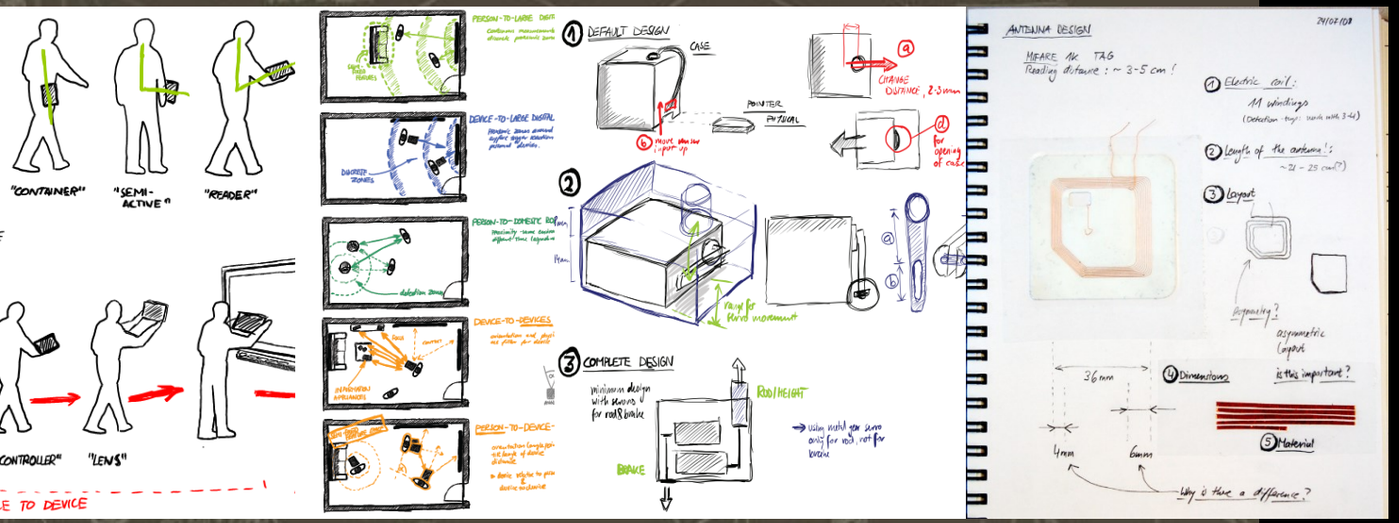


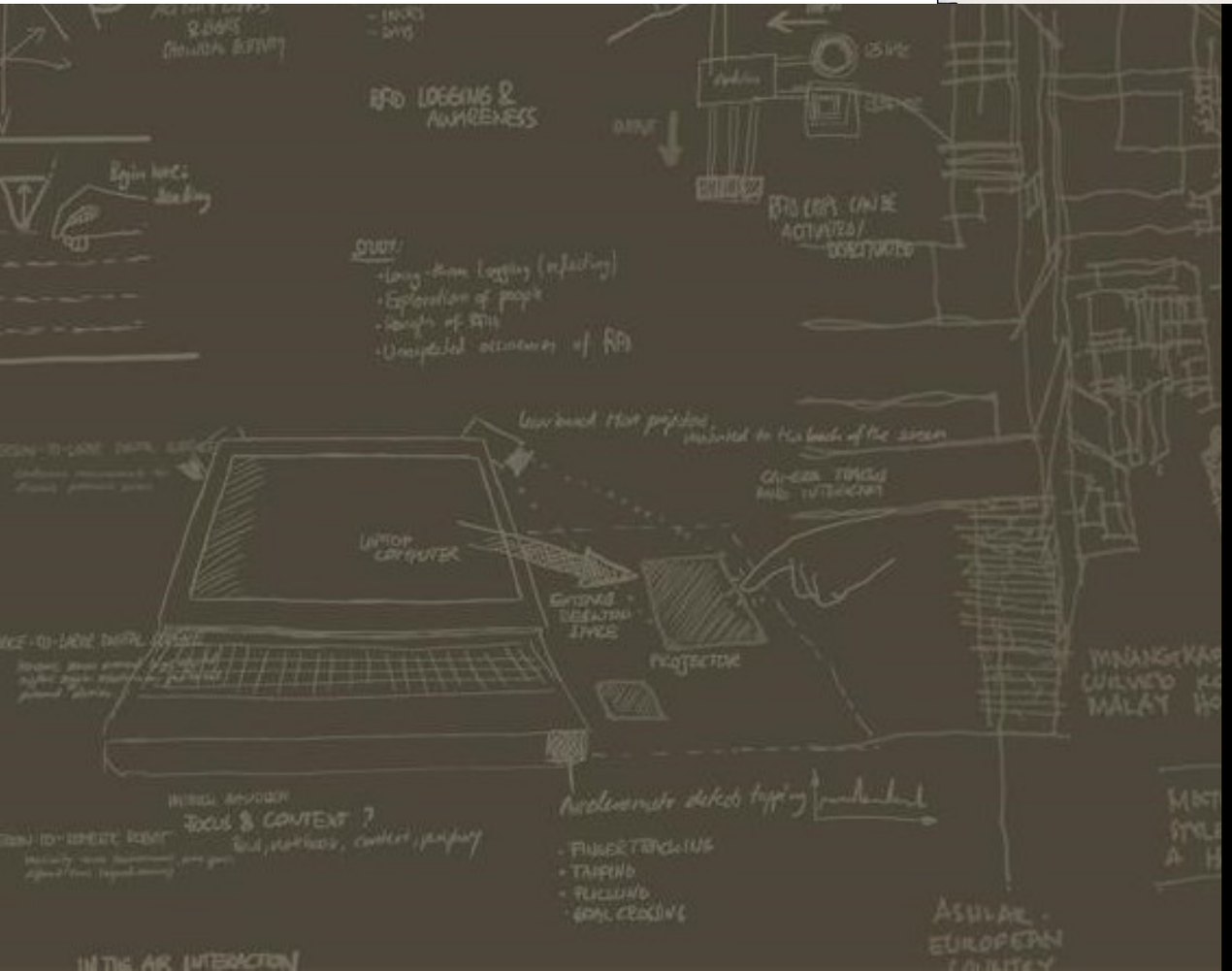





HOBBLE PHONE & RFID DETECT
RFID LOGGING & AWARENESS
LAPTOP COMPUTER
PROTECTIVE
FOCUS & CONTEXT ?
- FINGERTRACKING
- TAPPING
- PLUCKING
- GOAL CROSSING

Thank you





SKETCHING USER EXPERIENCES

STORIES STRATEGIES SURFACES

Nicolai Marquardt

Interactions Lab | University of Calgary
Guest lecture LMU Munich April 2013