

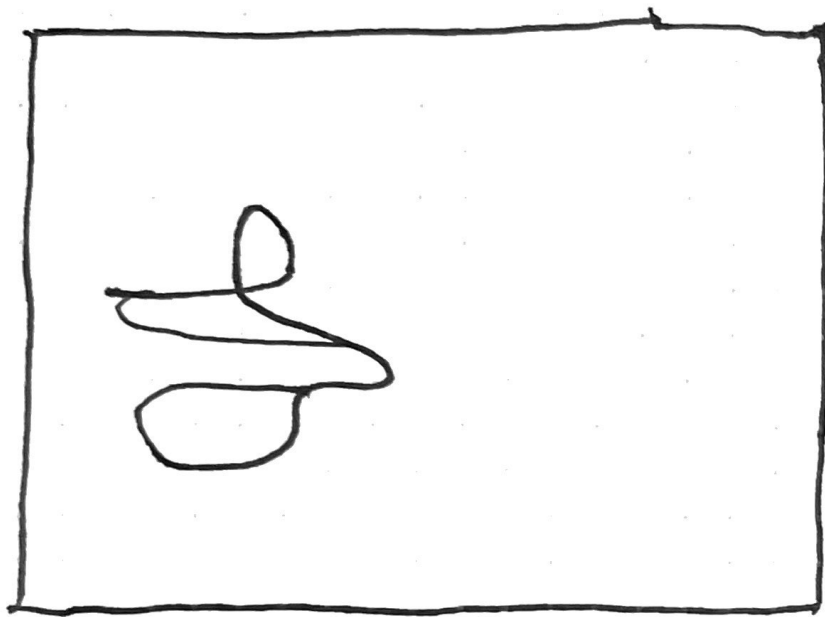


Hearing aid could have a ~~sensor~~ ^{scroll} sensor implanted use of micro-gestures to change volume.

Use-case: limited arm mobility, or perhaps someone w/ no hands or arms, and someone else would need to adjust volume w/out violating personal space.



Use of a micro "scroll-wheel" gesture to change volume.



currently, SOCI boards,
are this size... but, this
is alpha hardware and
will inevitably shrink w/ age.

Q: would the radar signals
interfere with loop-
back systems?

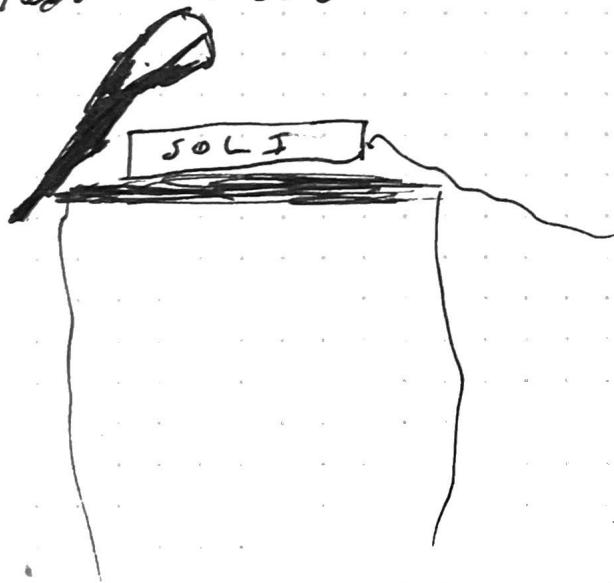
opening / closing hand (classification)



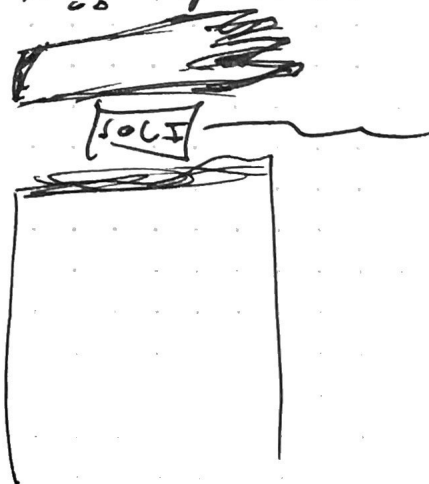
- range doppler
- micro doppler
- range profile

hand closed / spread open

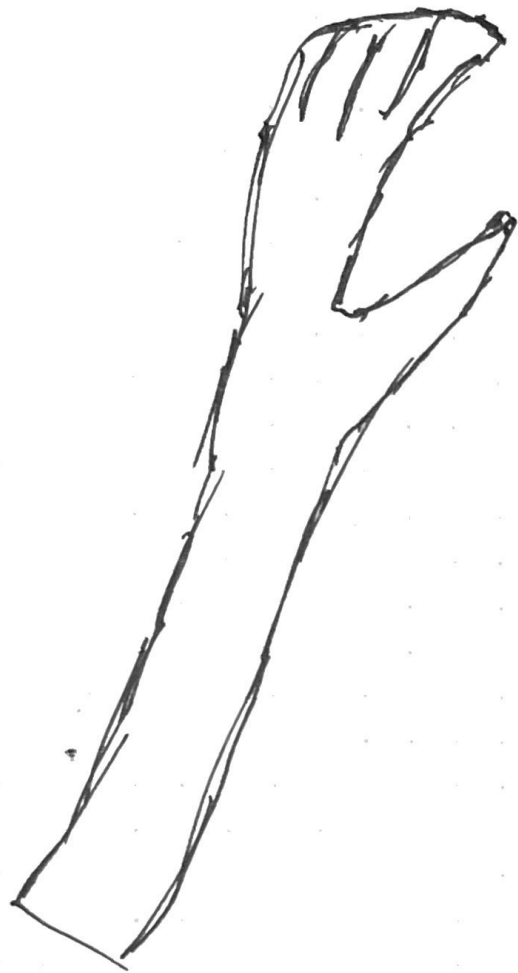
Arm leaving go
table, hand close go



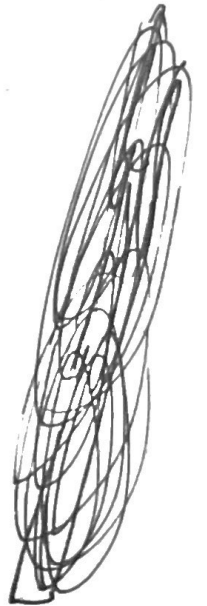
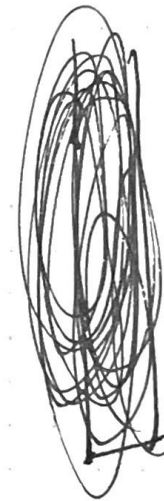
Hand then
moves right
top of it



- IQ plot
- range doppler
- micro doppler



Hands
over
season
and spreading
apart
upwards



• Range doppler
• Range profile
• IQ plot

Horizontal Swipe

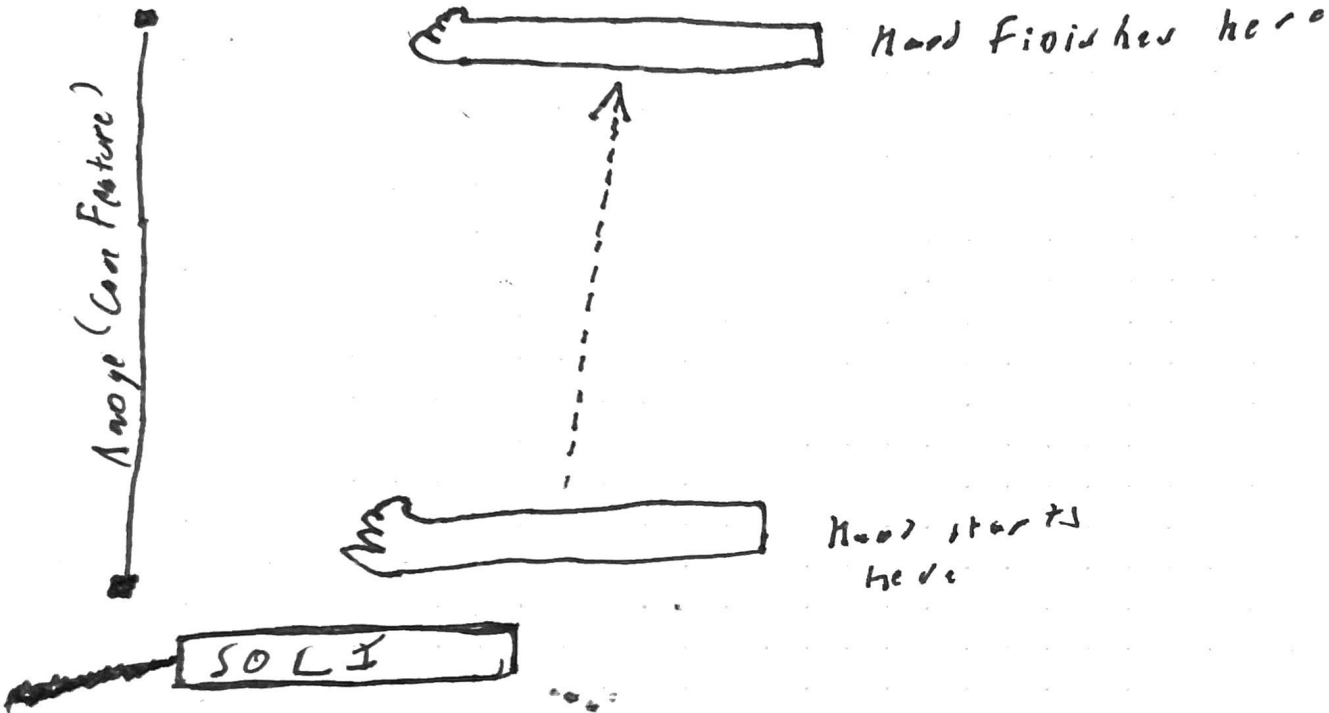


gesture
starts
here
(with
hand
holding
still)

gesture
ends
here

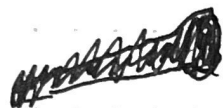
- Range Doppler
- Energy total
- Energy moving
- Acceleration
- Velocity
- Velocity Dispersion

Vertical Swipe



- Range Profile
- Range Doppler
- Energy moving
- Velocity
- Energy Total
- Range
- Acceleration





gesture



A "conducting" gesture

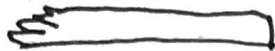
Hands start out on either side of the sensor, and then move up over top of the sensor to meet in contact.

- Range Doppler
- Micro Doppler
- Range Profile
- Energy Analysis

Wekioator + SOLI Experiment)

Hand position - Classification (K-NN)

①



- Range Profile
- Range
- Spatial Dispersion

②



Project Name: Hand Height
position (Classification)

②



CLOSED
HAND,
and a
downward
motion

• ID plot
is a cusp and retreat" gesture

①



OPEN
HAND

③

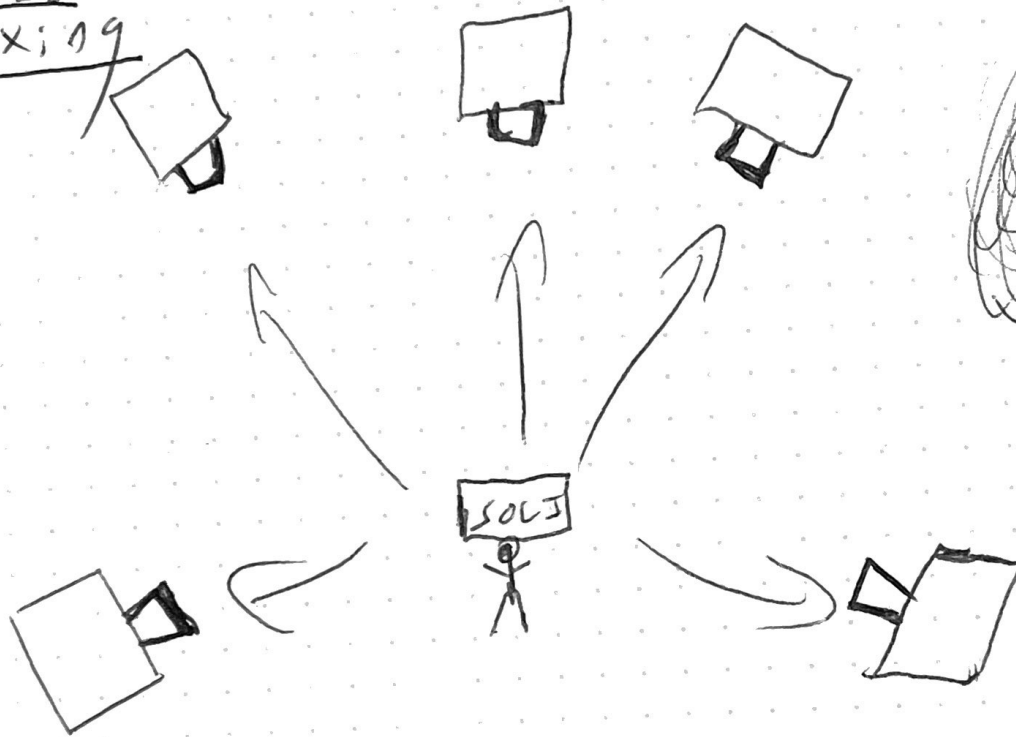


CLOSED
HAND

this is done
as one fluid
motion.

Action Method

SOLJ
in surround
sound mixing



"scrolling,
flicking
motion
to control
audio
parameters"

Nick Arner

SOL I + Cardboard

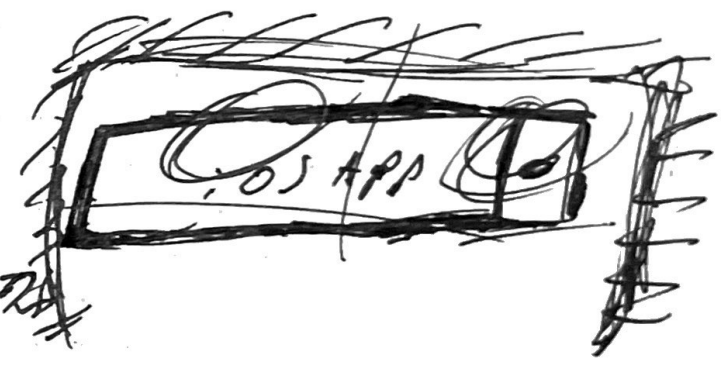
- VR / gesturer
- Virtual tools
- cool demo

- Send gesture mappings from SOL I sensor to virtual buttons or knobs in a cardboard app

- Not best VR platform for this, but it's just a prototype

gesture mappings

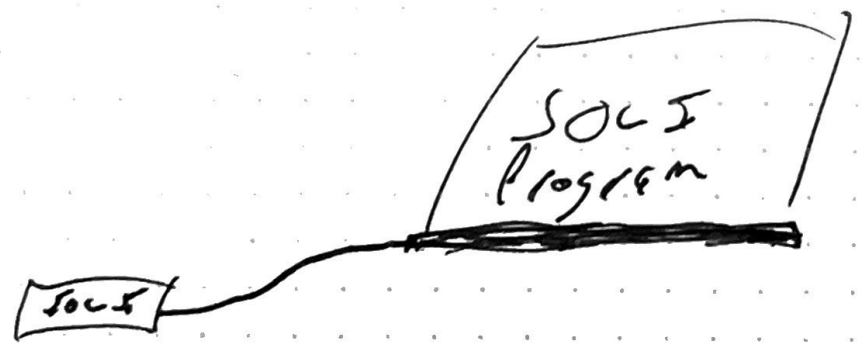
- pinch gesture → button on/off
- hand height → virtual slider
- scroll gesture → virtual knob

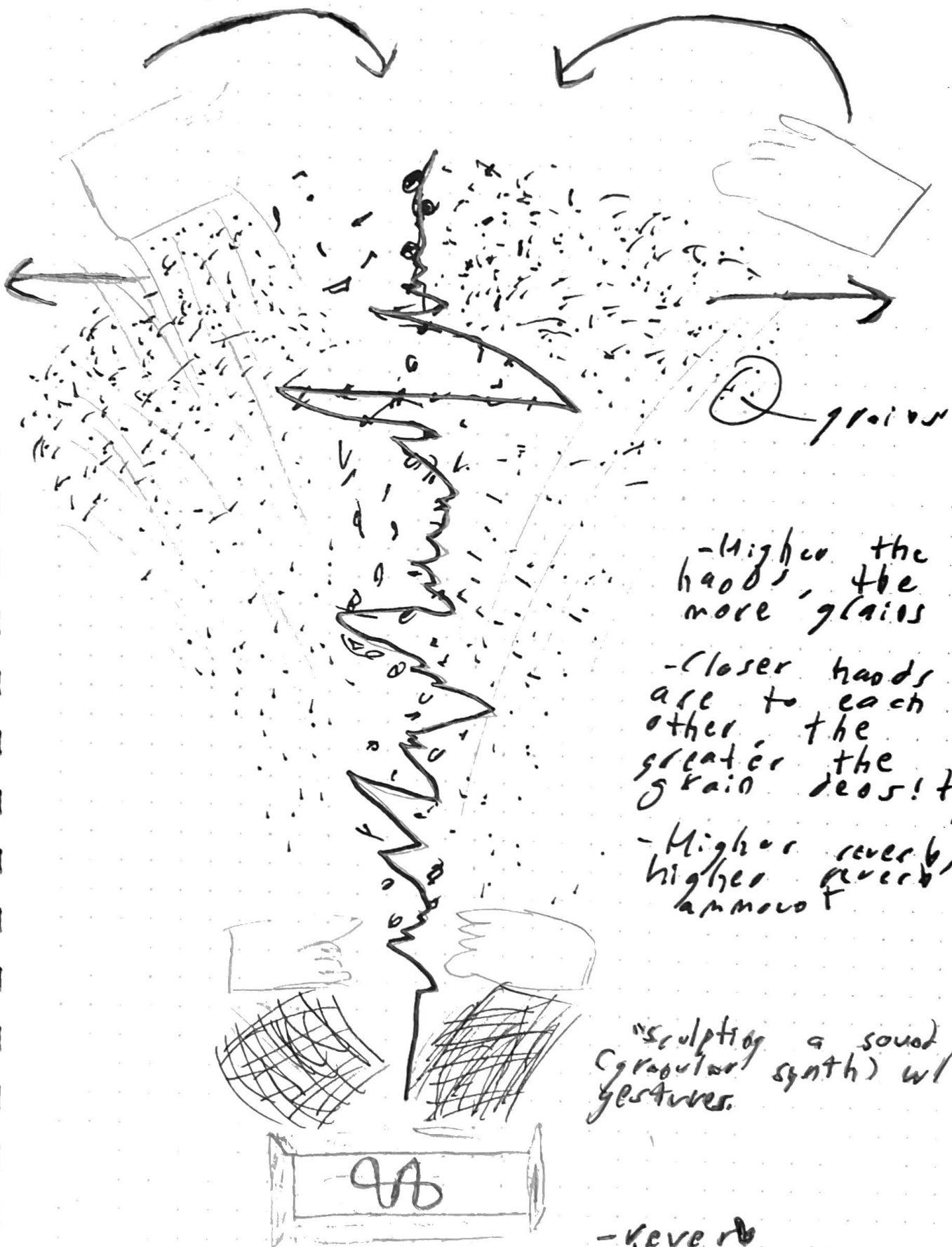


← OSC communication

(OSC control library is in development tools / Libraries)

Art in Method





- Higher the
hads, the
more grains

- Closer hads
are to each
other the
greater the
grain density

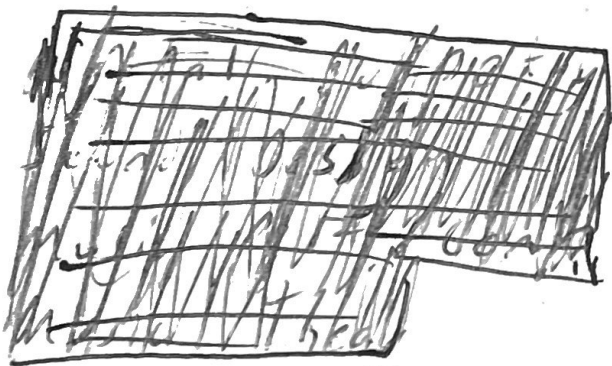
- Higher reverb,
higher reverb
amount

"sculpting a sound
(granular synth) w/
gestures.


- reverb
- # of grains
- grain density

Further sketches

- flesh out SOLI / cardboard
- horizontal granular synth in
i.e. "scrolling through an
audio file, and then tweaking
w/ micro gestures
- spatial mixing (pos at
speakers and adjust [?])



SOLI user

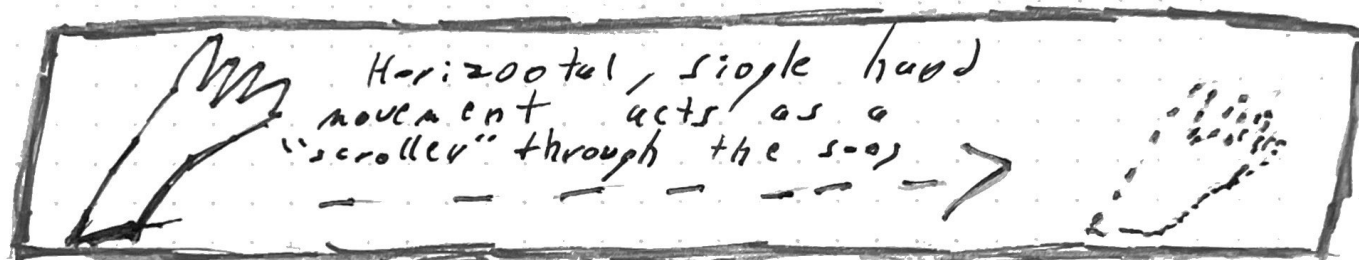
- Music Performance / Composition
 - Audio Editing / Sound Design
 - Interactive Visualization / Specification
 - Digital Puppetry / Generative Comp. Design
 - Robotics  Industrial Mfg.
 - Consumer Electronics
 - Wearables • Music Therapy
- Parkinson's
(Positive
Therapy)
- Nick Arner

"Horizontal Grauler
Synth (1)

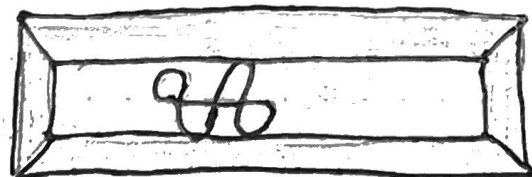
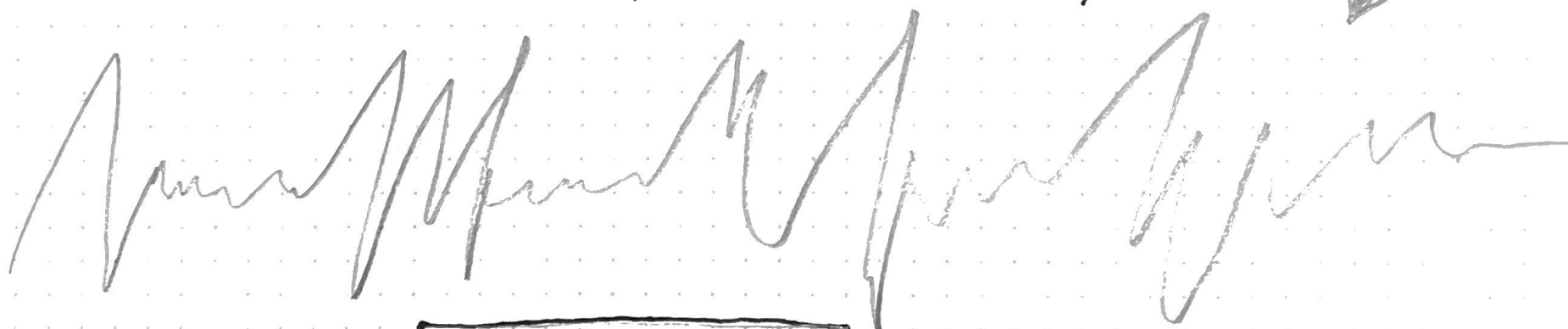
QB
Audio Editing Tool
(1)



Using both hands, you
can "select" a section
of audio. Snapping your
fingers could allow
some sort of
cut / copy / paste action.

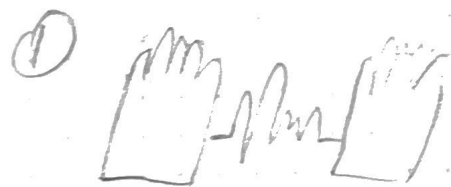


Time (position is 5009)



"Horizontal Granular Synth" (2) OR Audio Editing tool (2)

Once a user found a selection in the audio they wanted to crop, they could do so by snapping a finger. They could then start editing/adjusting param values using digital-tool "virtual dial" gestures.



Audio is "selected"
(cropped?)

②

SNAP!

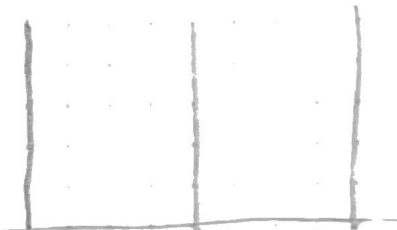
Finger snaps
"selects" the
audio...

③

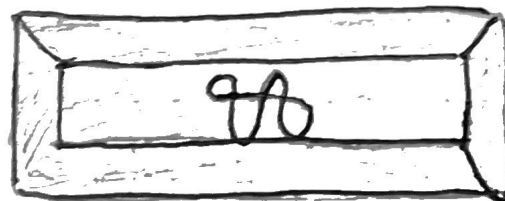
①

②

③



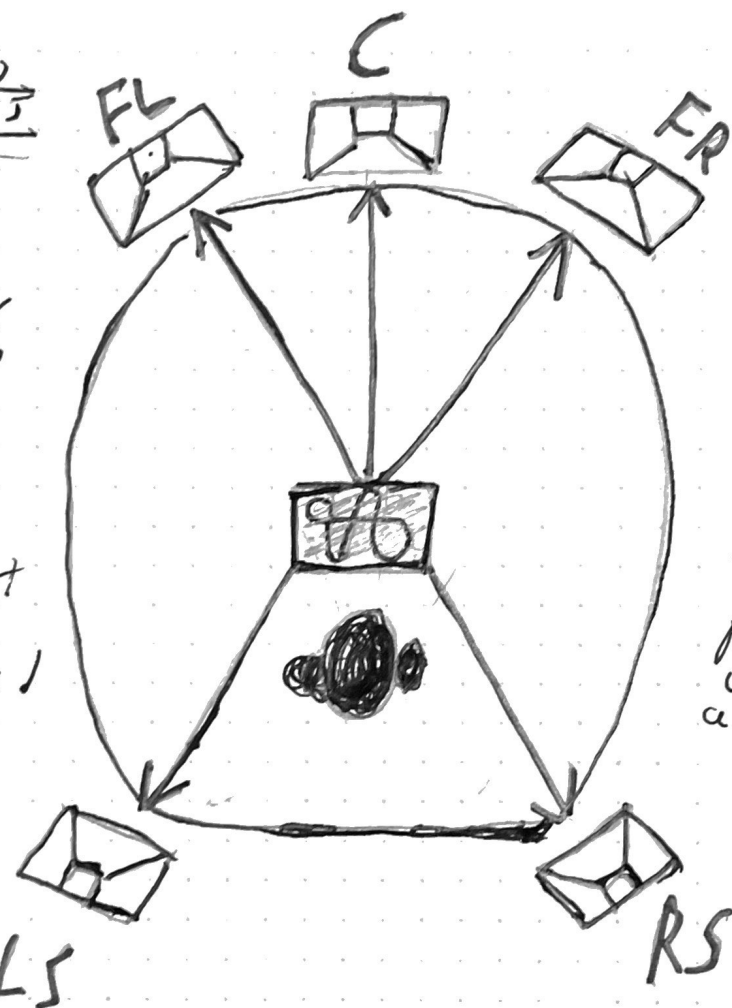
for controlling
params (EQ,?)



Problem: This uses modes.
Try not to
use those...

Survived - sound Mixing with SOLs

User would point to whatever speaker they wanted to focus on. They would specify which instrument or instrument group they wanted to use with a "flick" ^(gesture) gesture. They could then use a set of digital "tools" gestures to adjust volume panning.

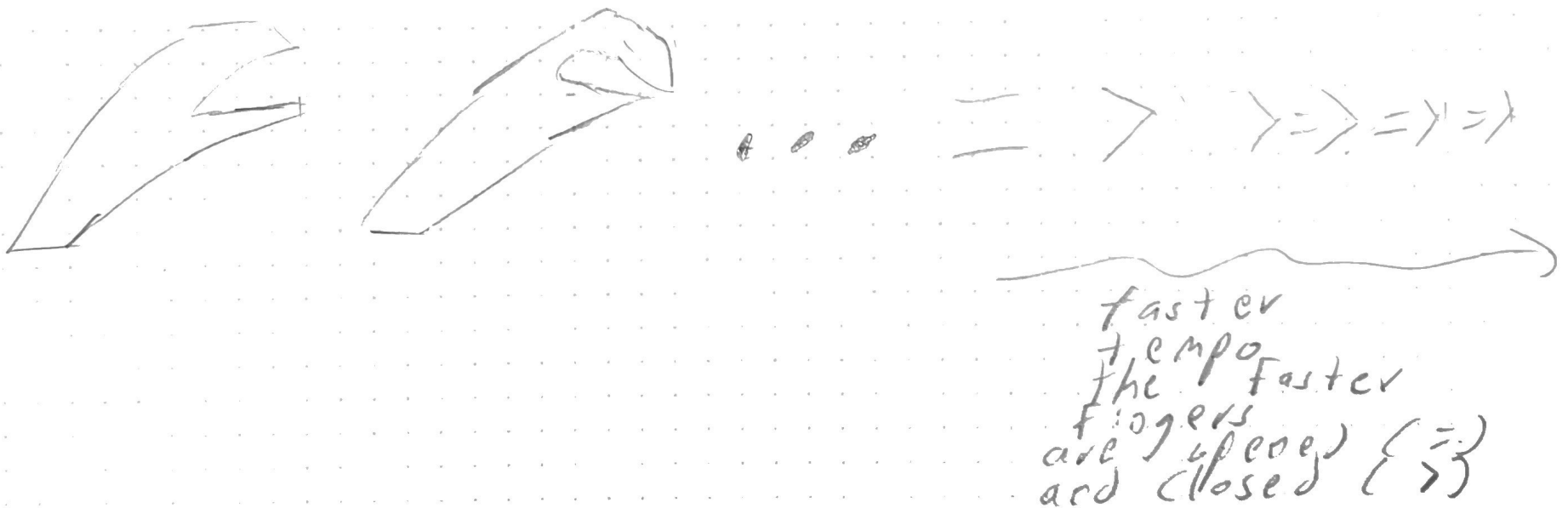


This would probably be more beneficial in a live scenario, rather than a recording studio... the user could potentially use a wearable w/ SOL and walk around a venue or installation where it would be inconvenient or cumbersome to use a mixing console.

Nick Arner

Tap Tempo / Audio on/off with "digital button" gesture

Appropriating the "virtual
button" gesture as
a tap tempo
controller.





① Open Hand
Mix = 100% wet



② Half-Open
Mix = 50% wet

Mix = 100% dry



③ Closed Hand
Mix = 100% dry

Action Method

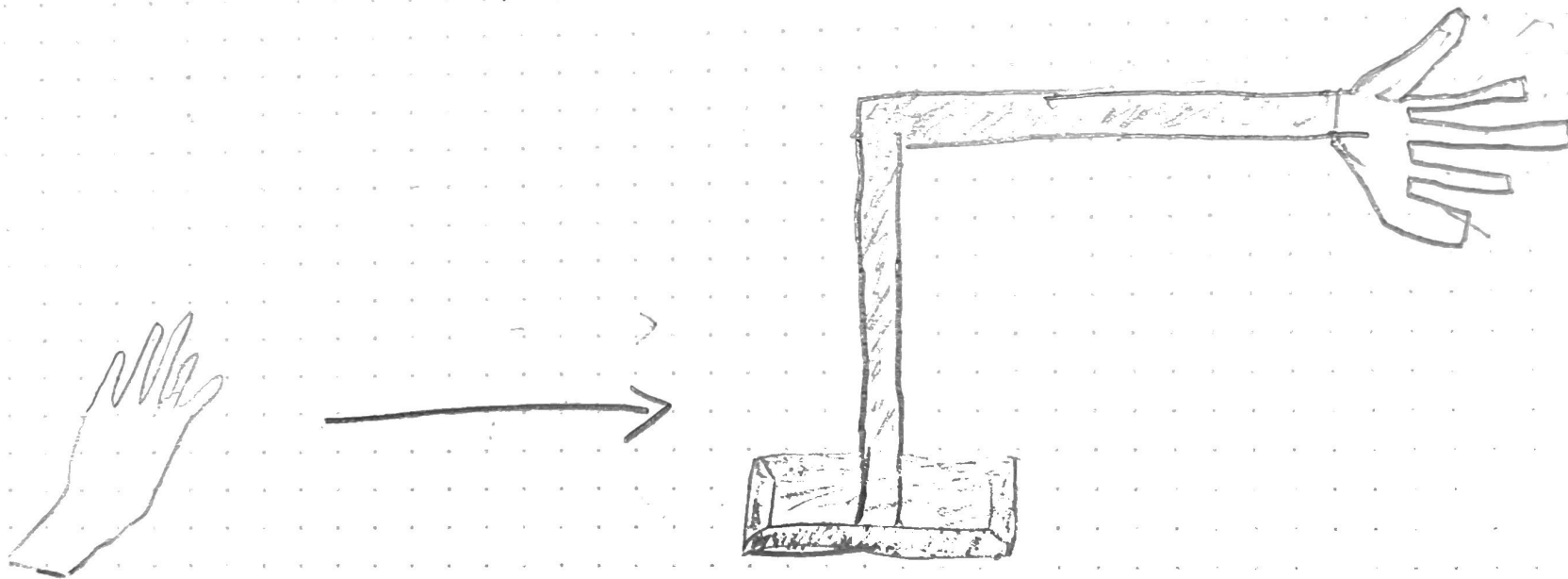
Use a Fist
to control reverb
amount

- Treat reverb as something "escaping" the hand
- "Said is a sieve"



SOLI + Robotics

- Can we train a robot hand to perform micro-gestures...
- What are the manufacturing potentials of micro-gestures?
- Any hazard / safety benefits?



Playgrounds for Solo Controlling

- Playback Speed

~~Pitch Shifting~~ Time stretching / Pitch Shifting

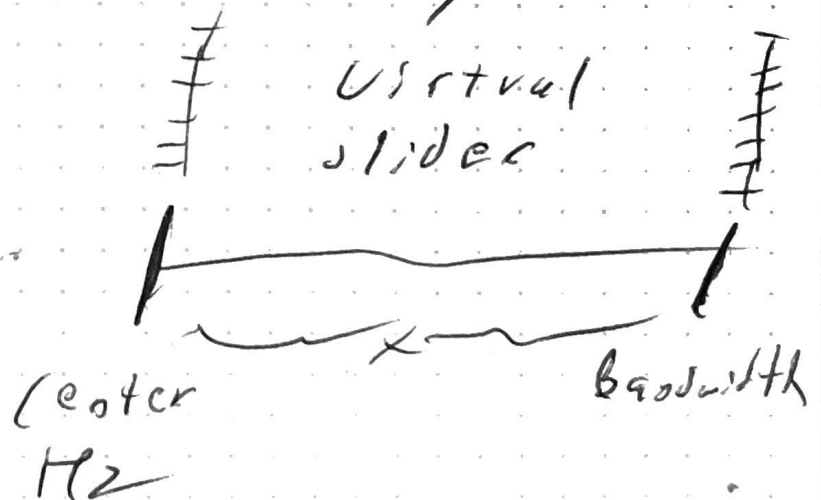
- Variable Delay

- Modal Resonance Filter (squeezed hand = H2, finger lifts = quality factor)

- Phaser Operation (Fingers dragging upward)

- Sean Costello Reverb

- Band Pass Filter = mixing

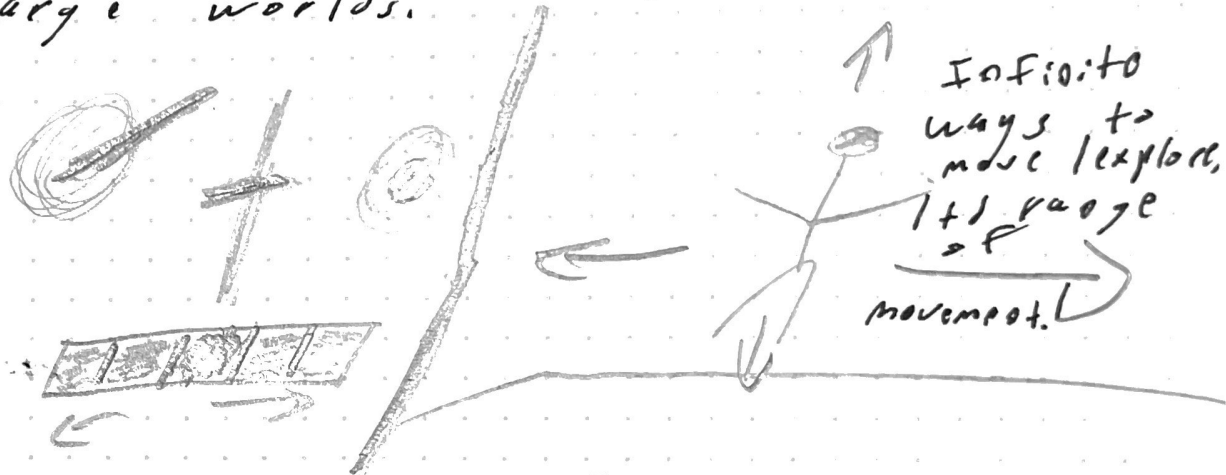


Chai Vavra:
 use skill to
 amplify small
 actions to
 get big results
 ... aka research
 on Fitts' Law

The ability to amplify small gestures into
 large ~~actions~~ actions for the potential
 for great use in VR... manipulation
 of objects and navigation of
 large worlds.

Amplified result

small,
 micro
 actions
 and
 gestures



"Big" soundscapes
 (purposefully nebulous) /
 small sound adjustments
 controlled by small
 gestures or hand movements

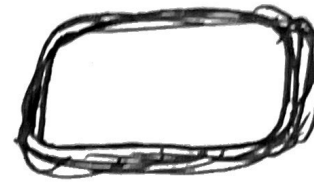




+



(or)



talk to!
Kris Schultz



Button



sliders



Knobs

These
will come
later...
i.e., Beta kit
(2017)

Hand track toy +

micro gestures

- best for small movements

(i.e. not like a track;

doesn't have occlusion

problem)

Q: Given the medium,
what would be good
to demo using
hands / small gestures.

OF
Free
Displacement

OSC
→

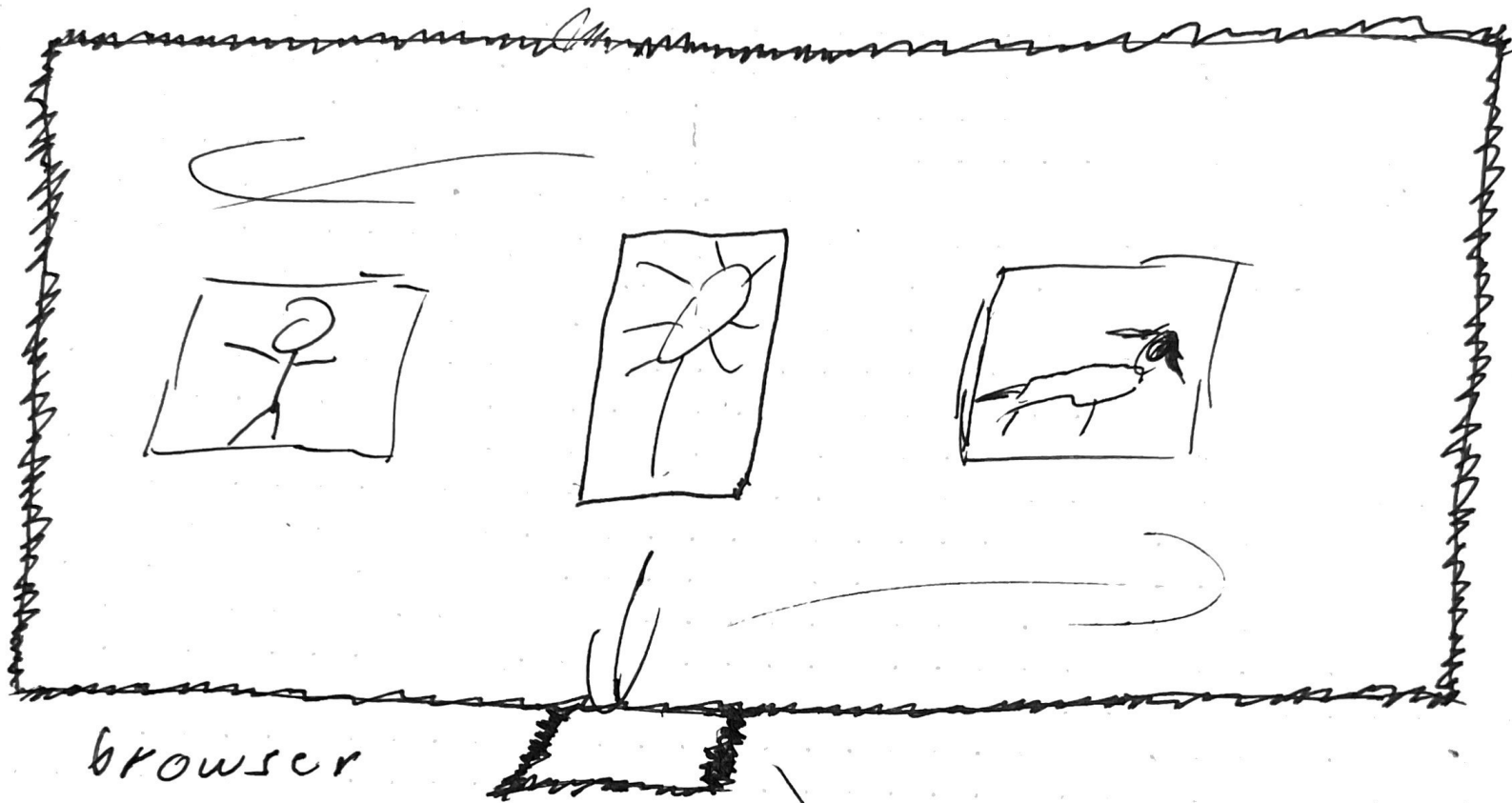
Jitter

Web Cam

1/26

iot value =
Feedback
level

screen



media browser
that uses swipes
to navigate.
A "come here"
gesture towards
the subject
will "pop" the
media

emphasized
highlight...

FFT CONFIG

FFT

WINDOW SIZE

HOP SIZE

DIMENSION SIZE

COMPUTE PHASE ☒

COMPUTE MAG ☒

WINDOW TYPE A.D.

OSC 5/10

OSC Input Port 10

OSC Output Host 192.168.0.0

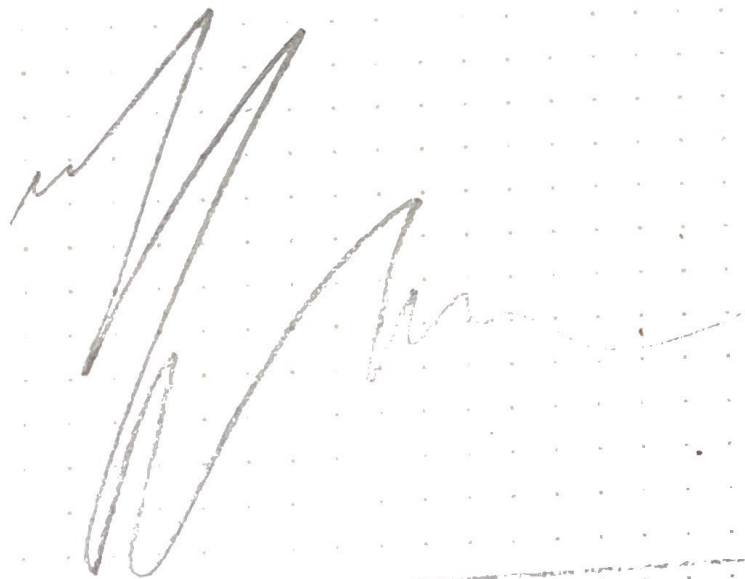
OSC Output Port 9000

OSC Address /DATA

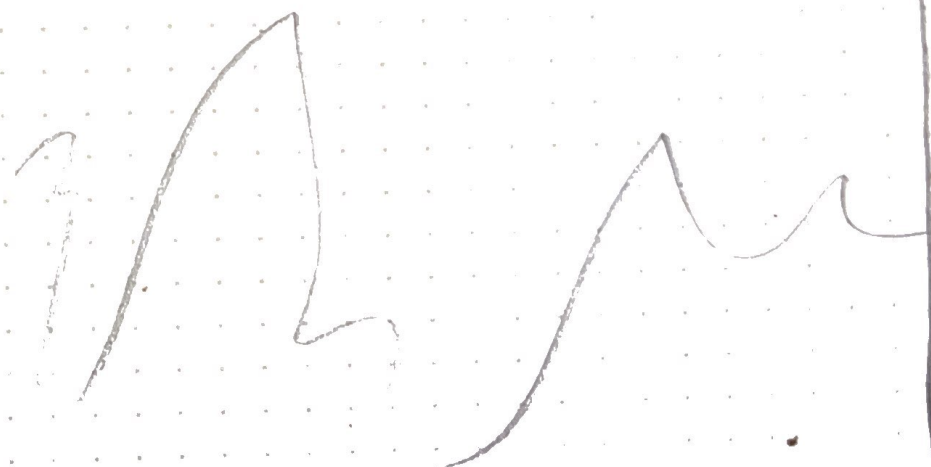
RECEIVE OSC 0

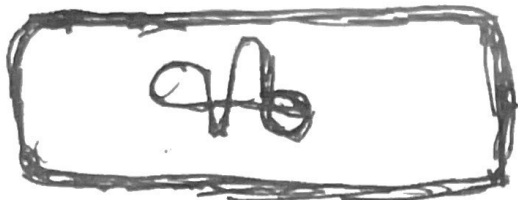
SEND OSC 0

MAG:



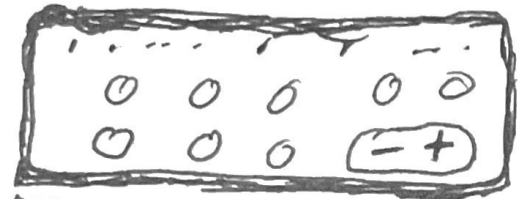
Phase





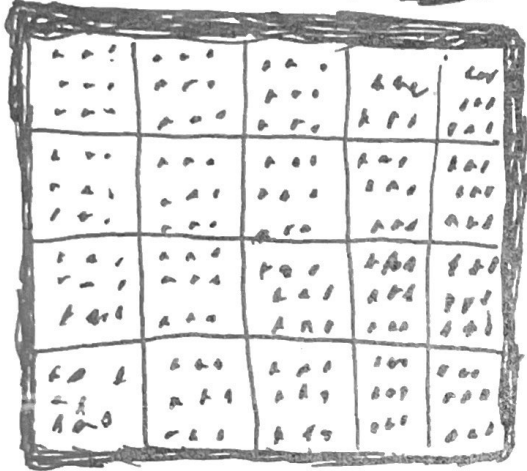
Sack
Block

→ Could also



Loop
Block

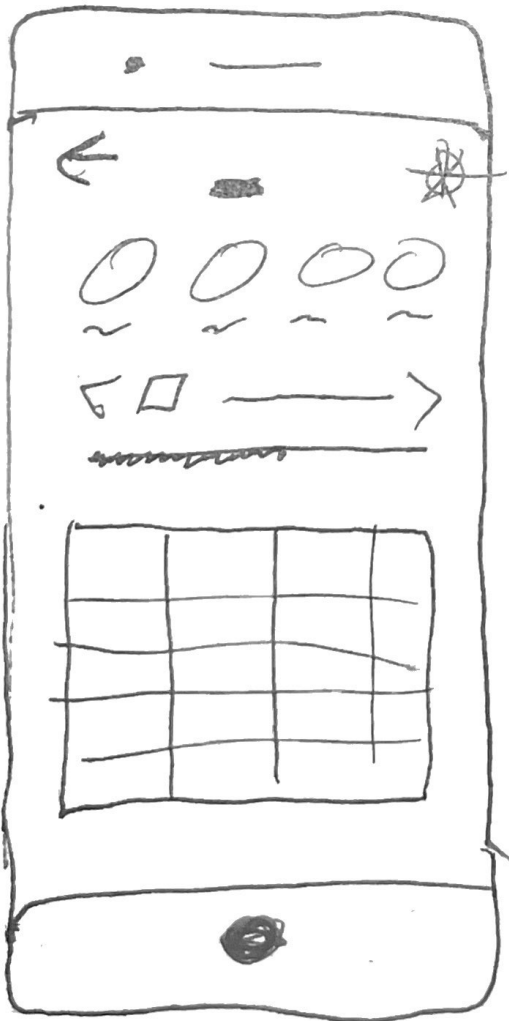
have pre-defined
gestures (easy)
or create your
own gestures
(hard)



Live
Block

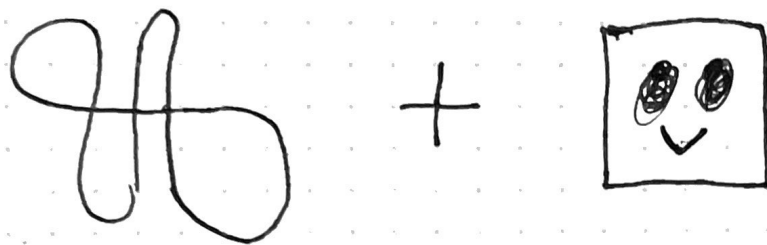
swipes (↑, ↓, →, ←)

would be a
great start, as
well as
has height
(range)



Noise
App

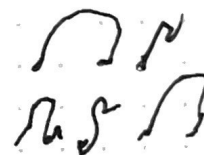
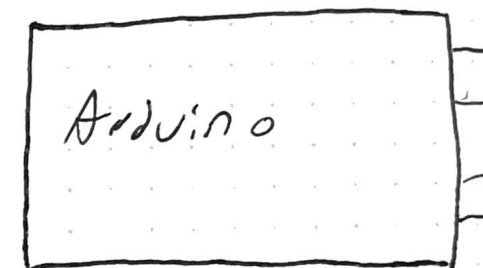
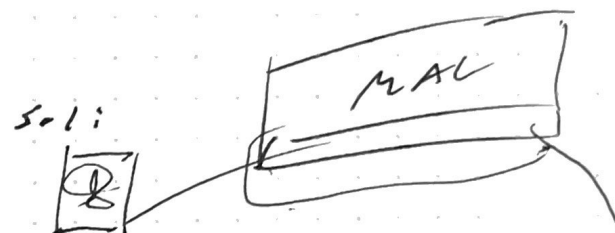




• Soli as means to activate
an I.T interaction
(make a gesture,
a ~~chip~~ chirp happens,
and your phone gets
some data

~~This is to make the
gesture~~
the gesture

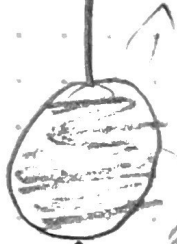
(Don't angle ~~it~~ as
a password!



①



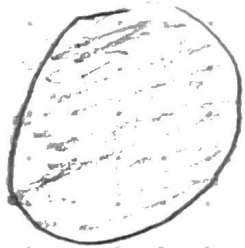
Ball destroyed
after going
above the canvas edge.



① Ball
goes
upward



② New
ball
reappears



(Ball goes
down if
swipe ↓)

swipe
up



②

Have the speed
param scaled and
used to affect
how fast the
ball moves.

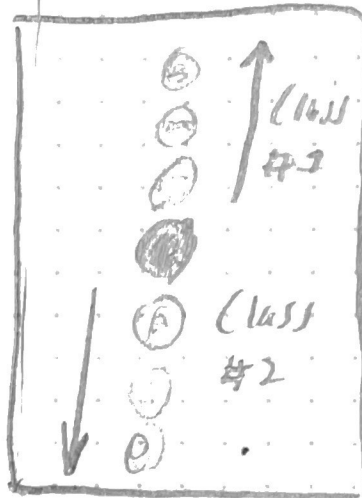
Sol: + OF

Copy Nick's ML tutorial

- Add in OSC message output
 - classification output
 - speed label (?) : part 2

• Get robust ↑ ↓ swipe
model + noise

• test OSC output



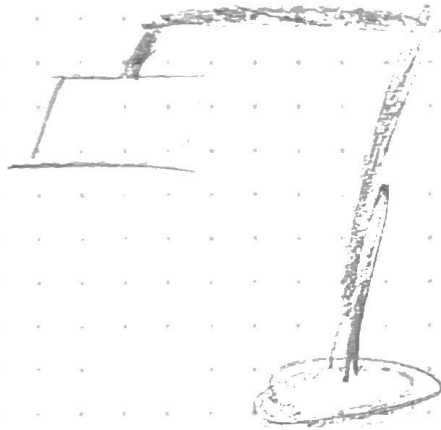
① colored ball is
middle of row

② ↑ arrow clicked,
ball goes up

③ ↓ arrow clicked,
but ball goes
down

Gesture controlled lamp

- when the head is at the bottom,
light is off
- when at top, at brightest



"Lamp
off"



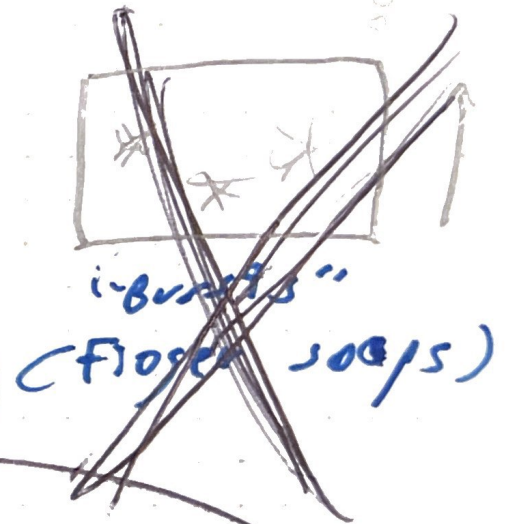
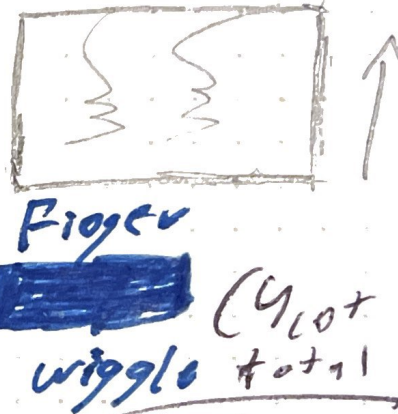
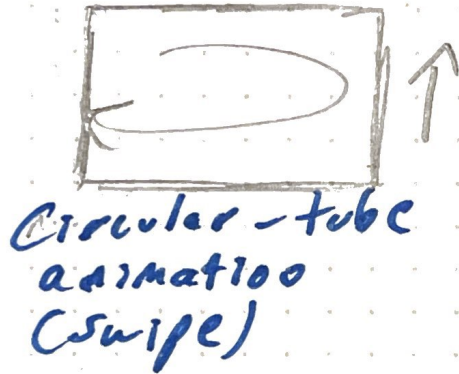
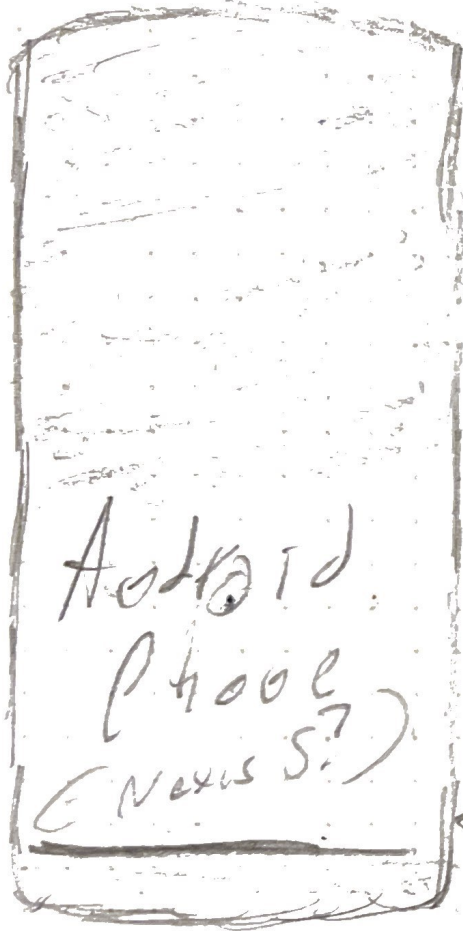
"Lamp
on"



- ① LED light
② Bulbs!

"Android Exp. + SOLI"

Control / trigger shader animation
with SOLI



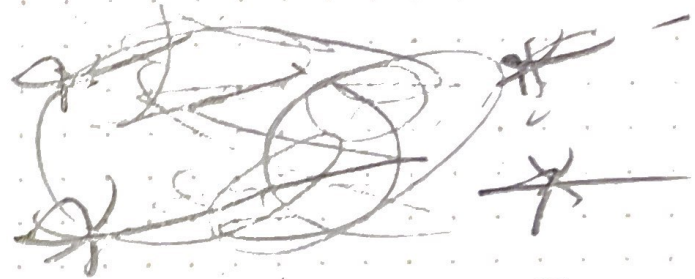
$\sim R = 1.5$

Of ML-Tutoria!

- Bestures to recognize:
- swipe
 - soap
 - finger wiggle

(2) - diff. project (particle systems)

Range
(Filtered)
control
particle
system
height



Finger
soap
inject
energy into
system

Hand grasp
to control
... something else?