Tangible Musical Interfaces

Martin Kaltenbrunner
Interface Culture Lab
Kunstuniversität Linz

professional background ...

interfaceculture

http://interface.ufg.ac.at/

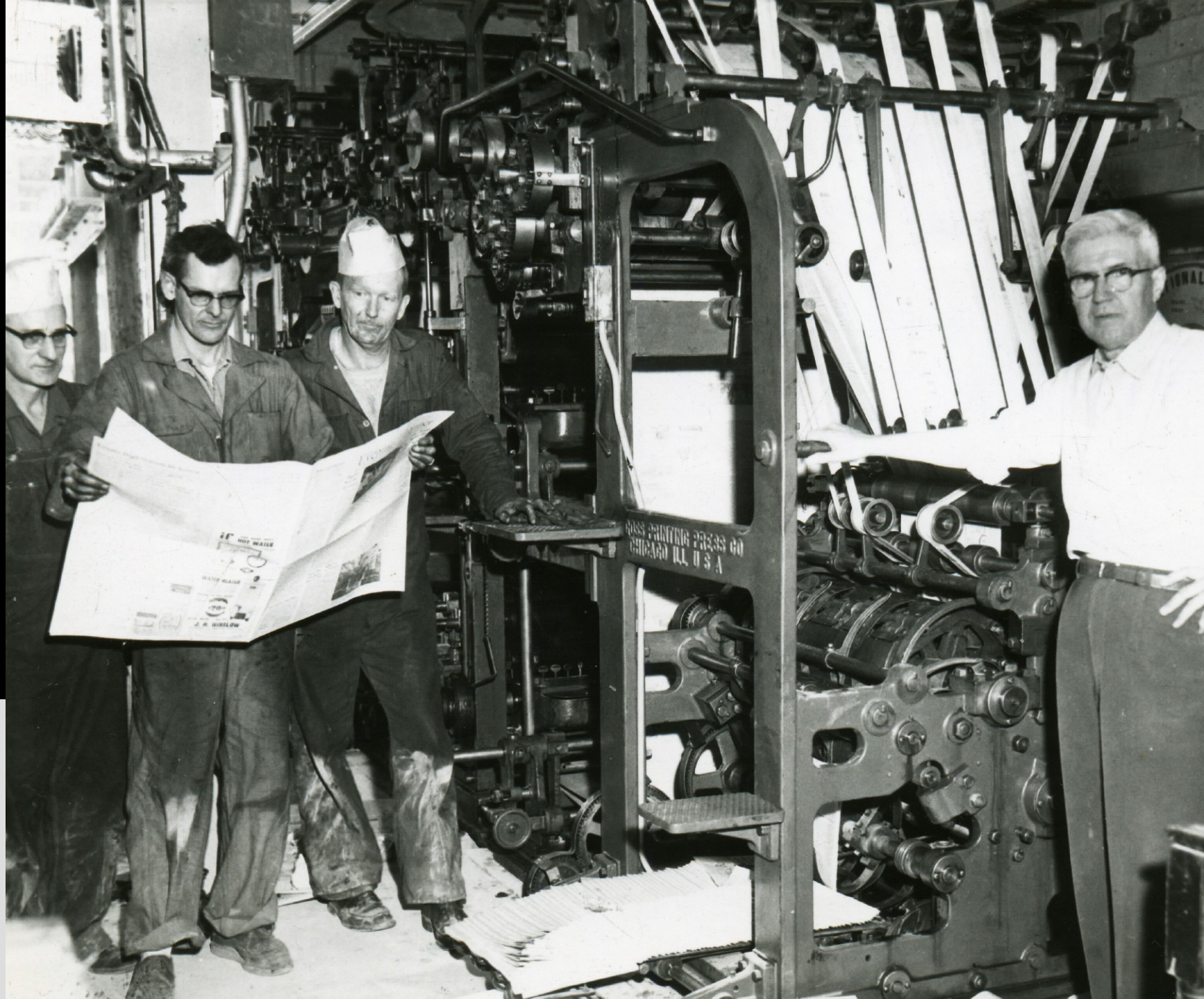
University of Art and Industrial Design, Linz, Austria

reactable

SYSTEMS

http://www.reactable.com/

Reactable Systems, Barcelona, Spain


GOSS PRINTING PRESS CO
CHICAGO ILL U S A

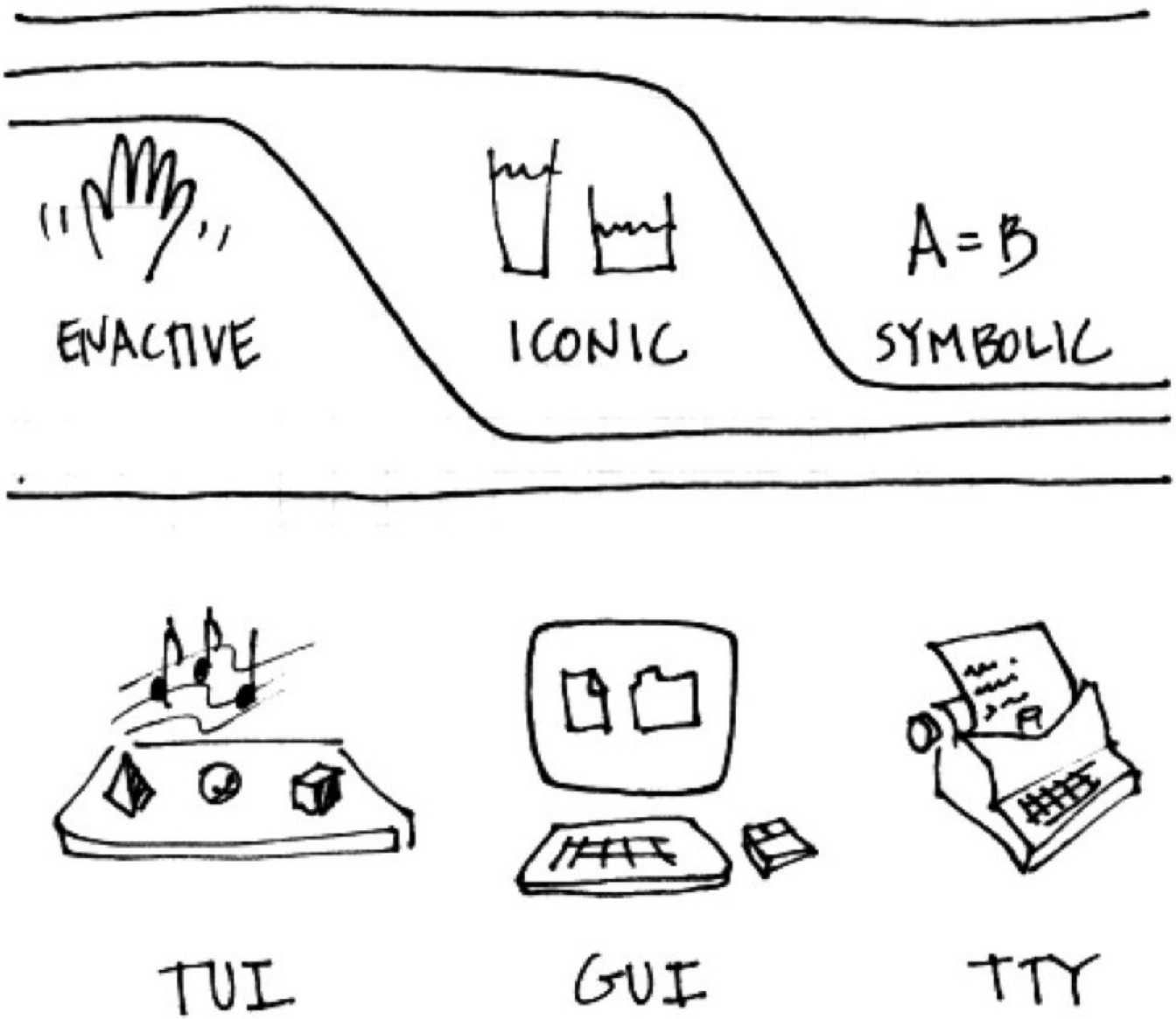
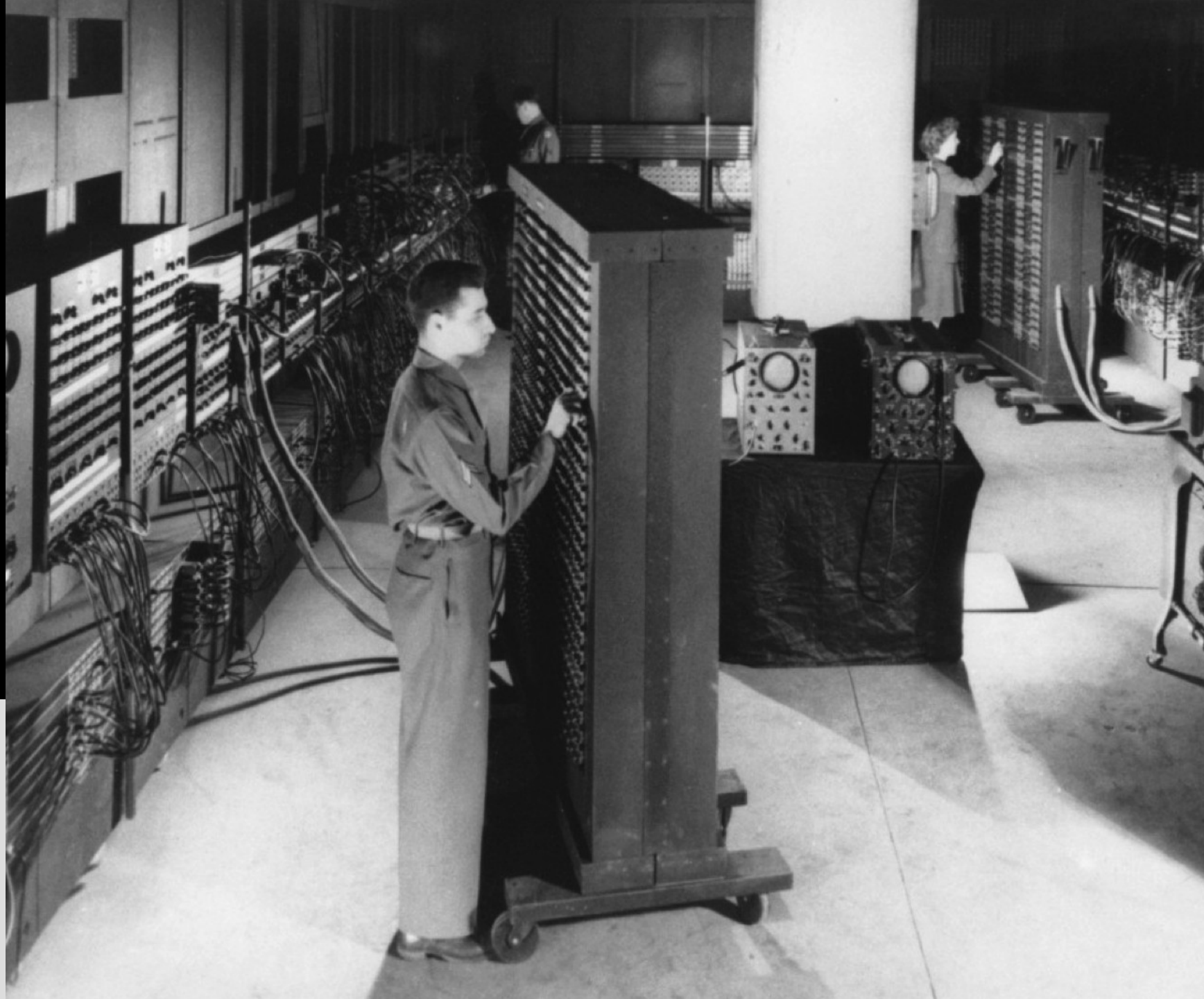


illustration: B. Verplank



XEROX
From the Japanese computer journal "ASCII"
XEROX

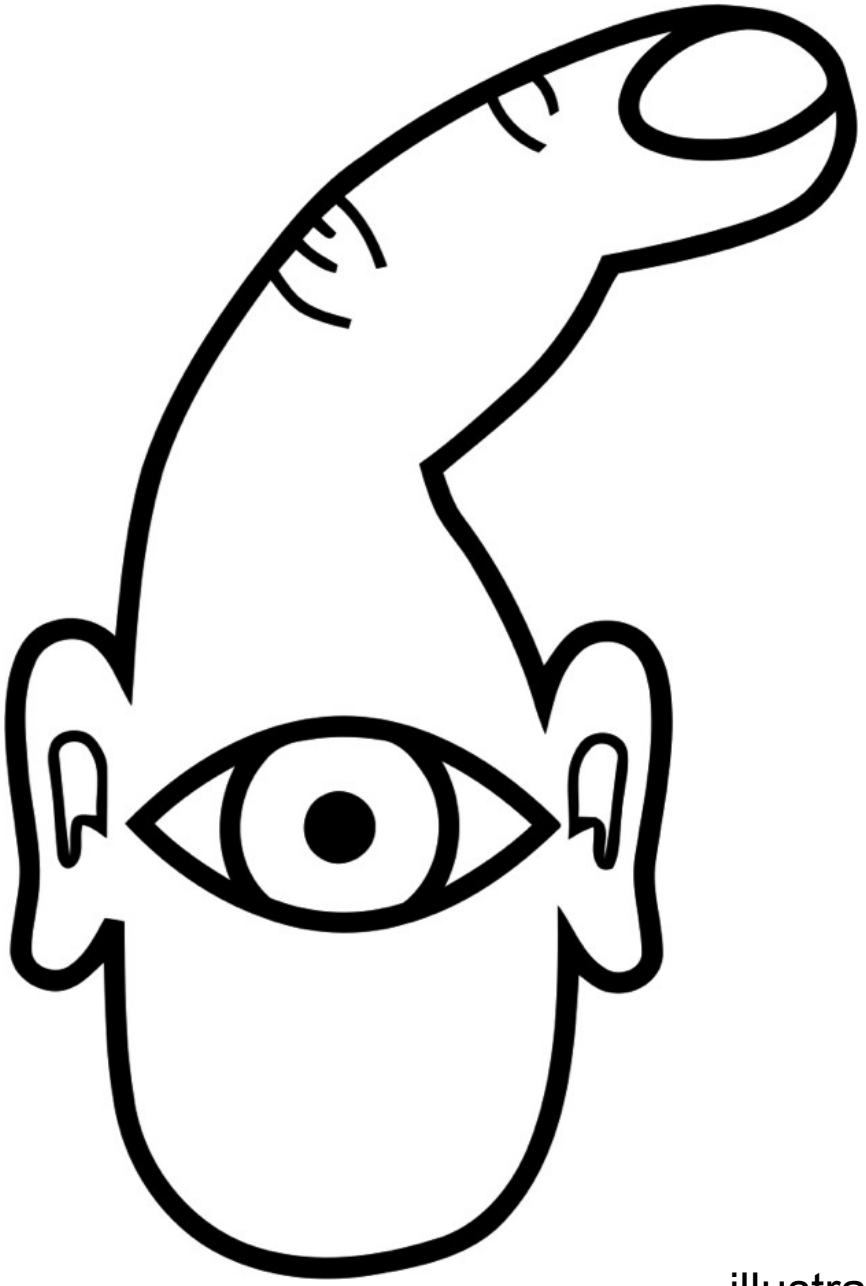


illustration: Igoe/Sullivan

The quick brown fox jumps over the lazy dog
Good and tight so it won't fall apart
Typography is the way we live

POLAROID
SX-70 LAND CAMERA

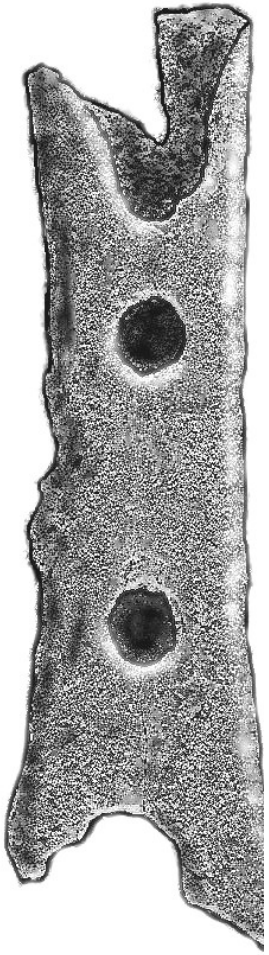
BRONDI

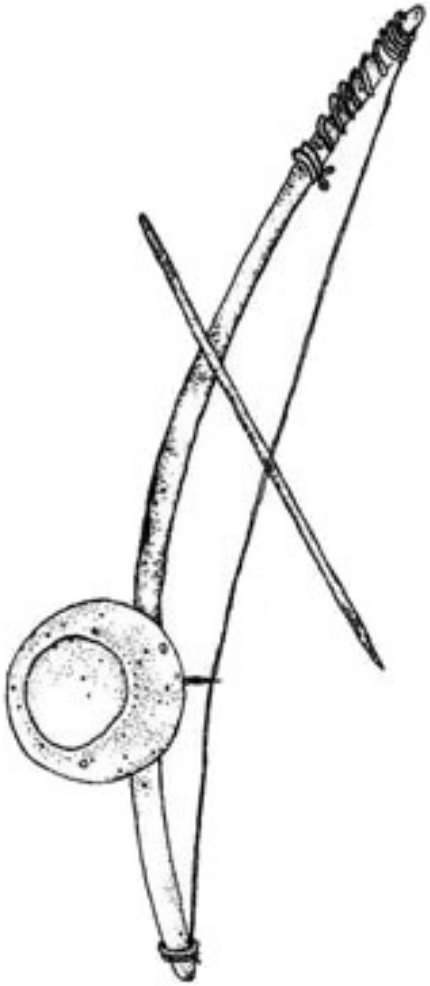
REVOX

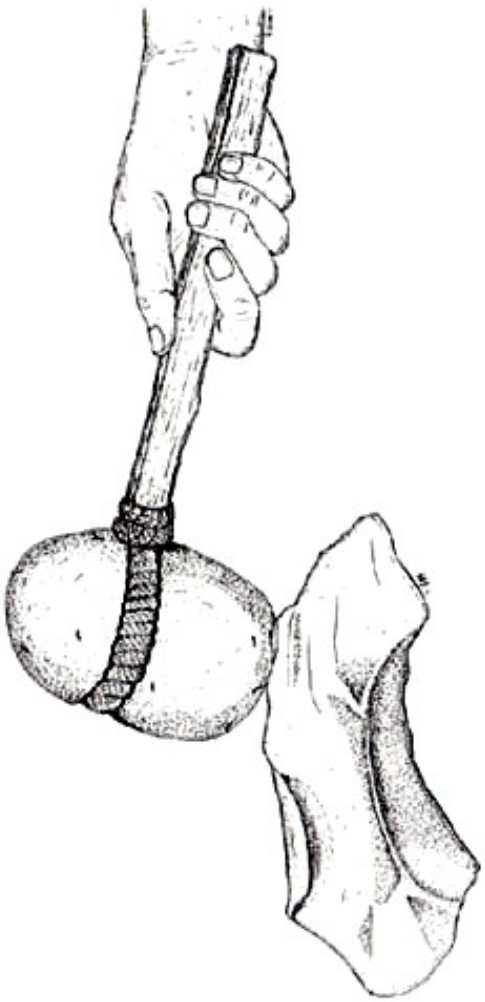
POST CARD
suckuko
Hey Honey Bunch,
Just Wanted To
Say I Can't Wait
To See You On
The 14th. We Have A
Table Booked For 8,
See You Then.
Love Mat x
Miss Kora Drury (My Valentine)
52 Saints Road
London
E1 9AY
carved by hand with love
ME & U FOREVER

Pumpkin Patch
Backyard Party
A Year Abroad

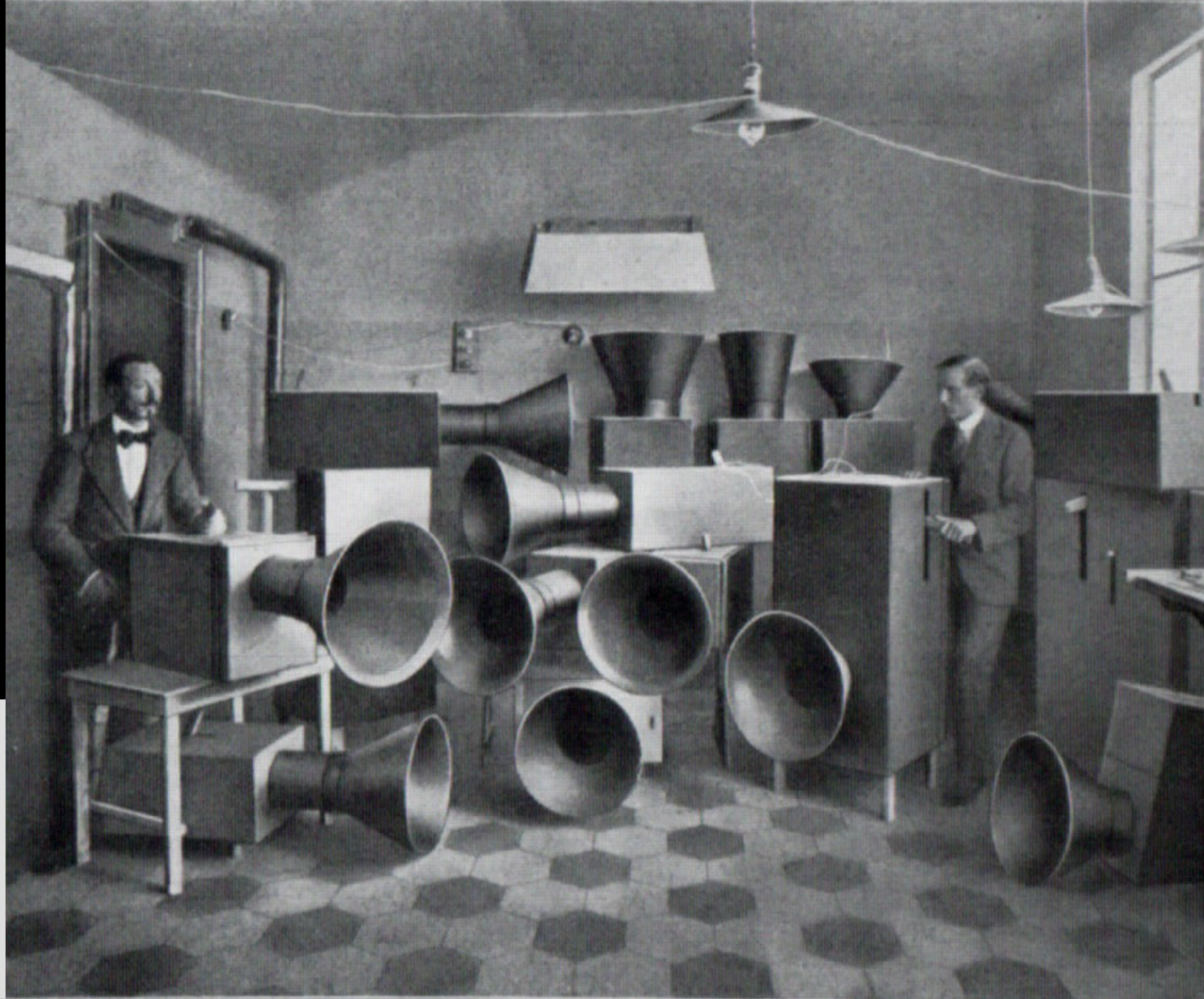
musical instruments 35.000 years ago ...



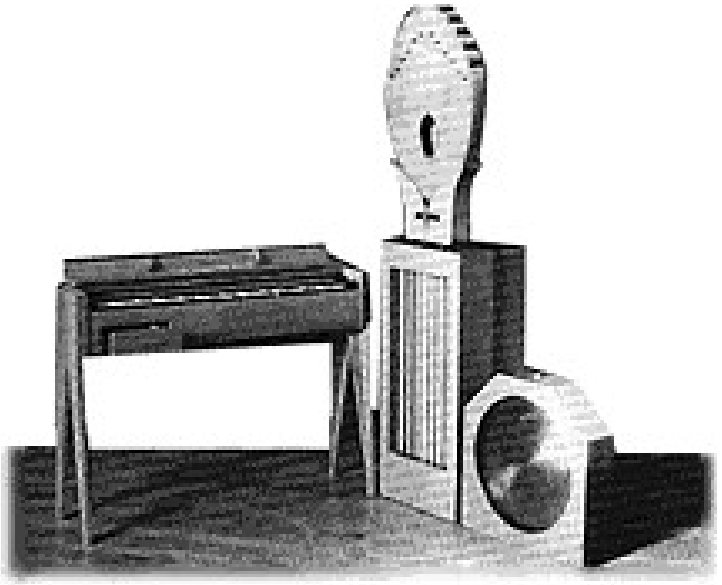


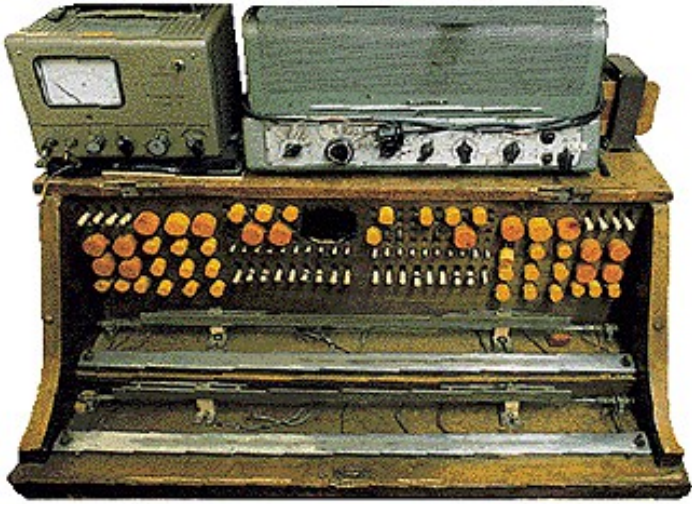


… until the 19th century

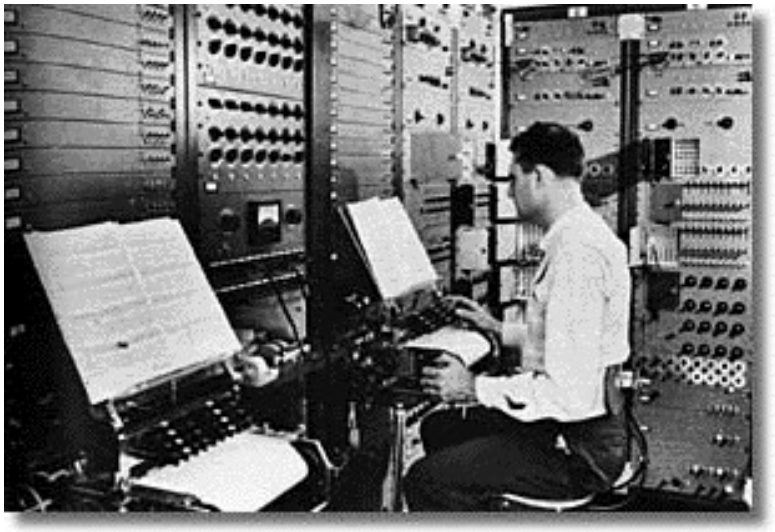


pioneers of electronic music

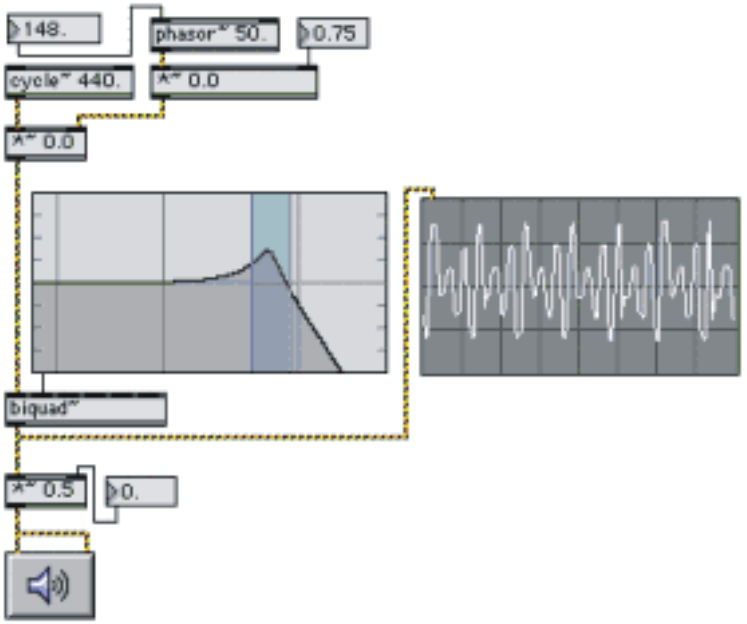




from analog sound synthesis



to digital sound synthesis



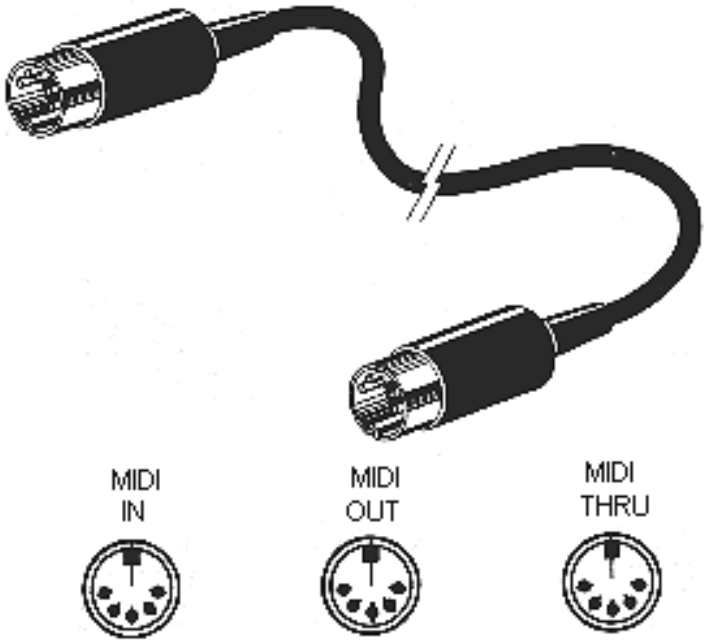
an office tool as musical instrument?

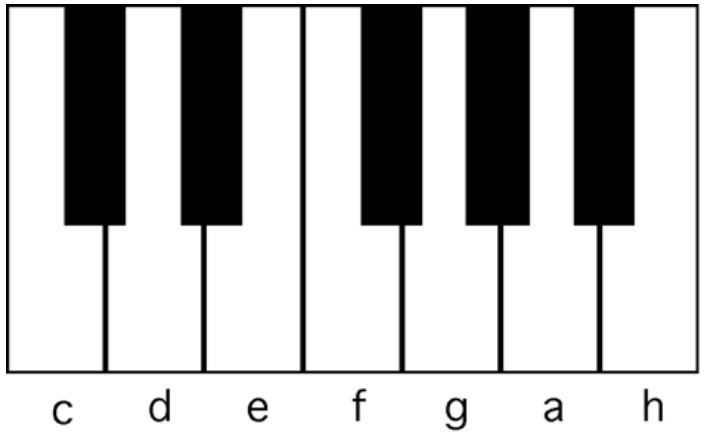
but how can we control all these parameters?

the need for extended musical interfaces

various types of musical controllers

decoupling control & sound generation





musical remote control

a musical instrument ...

... unifies control and feedback

Graphical User Interfaces

separate control from representation

Tangible User Interfaces

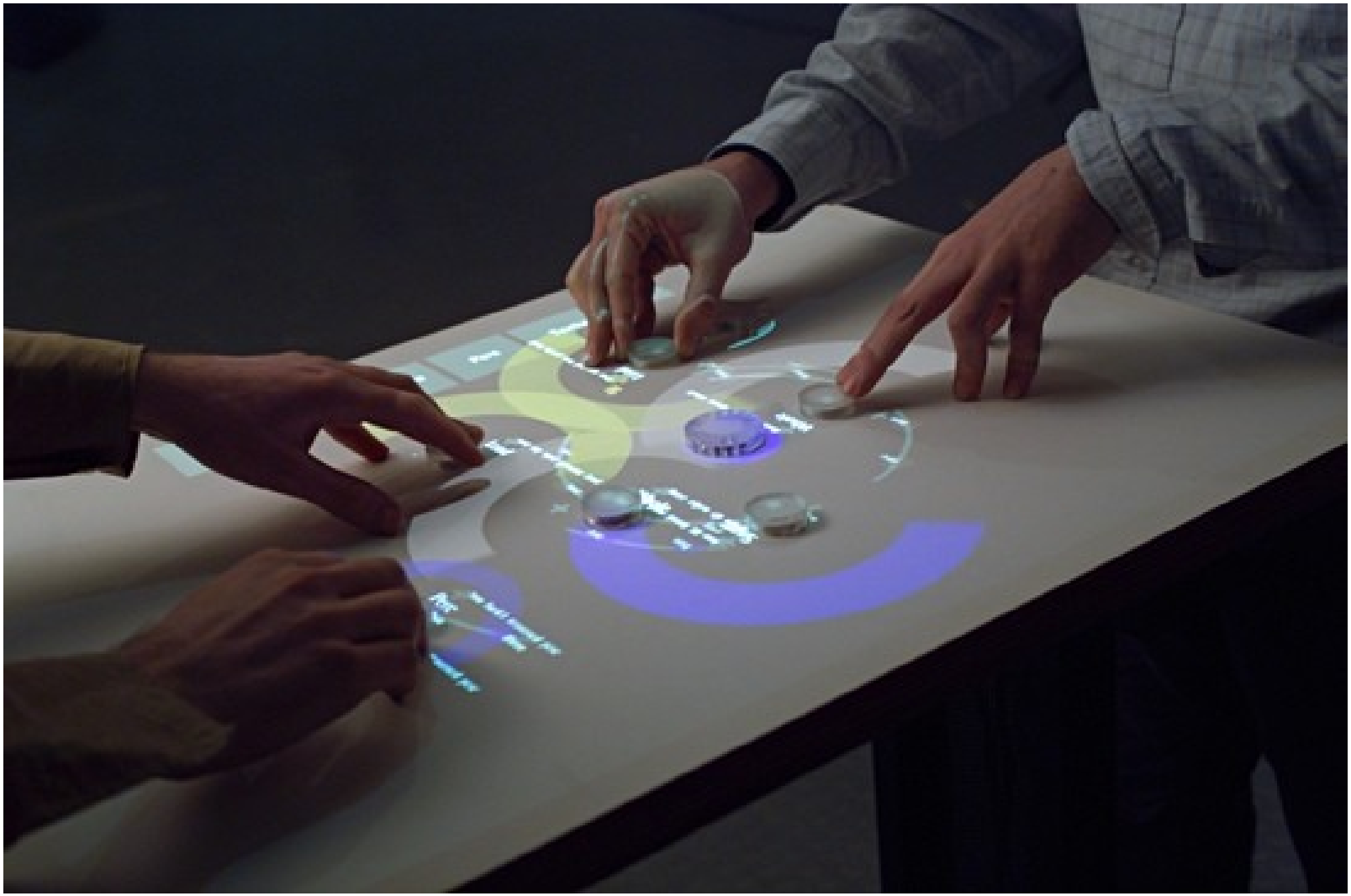
... unify control & representation within tangible physical artifacts

Embodiment

physical objects are containers for digital information and processes

Tangible Surface Instruments

Spatial Systems



Object Oriented Sequencers

Relational Systems

Token based Sequencers

Token-Constraint Systems

Building Block Sequencers

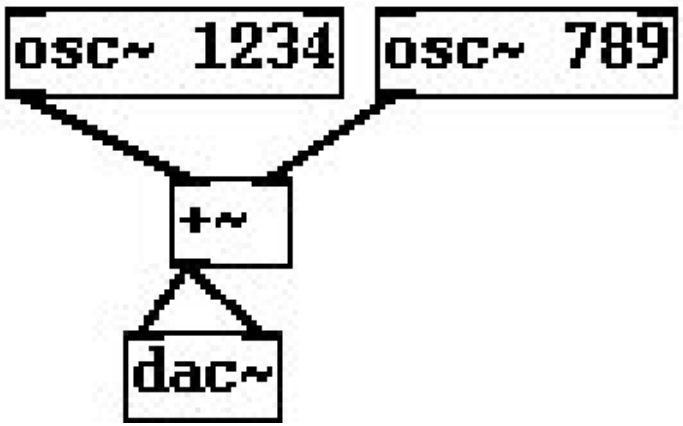
Constructive Assemblies

Tangible Musical Artefacts

Physical Containers

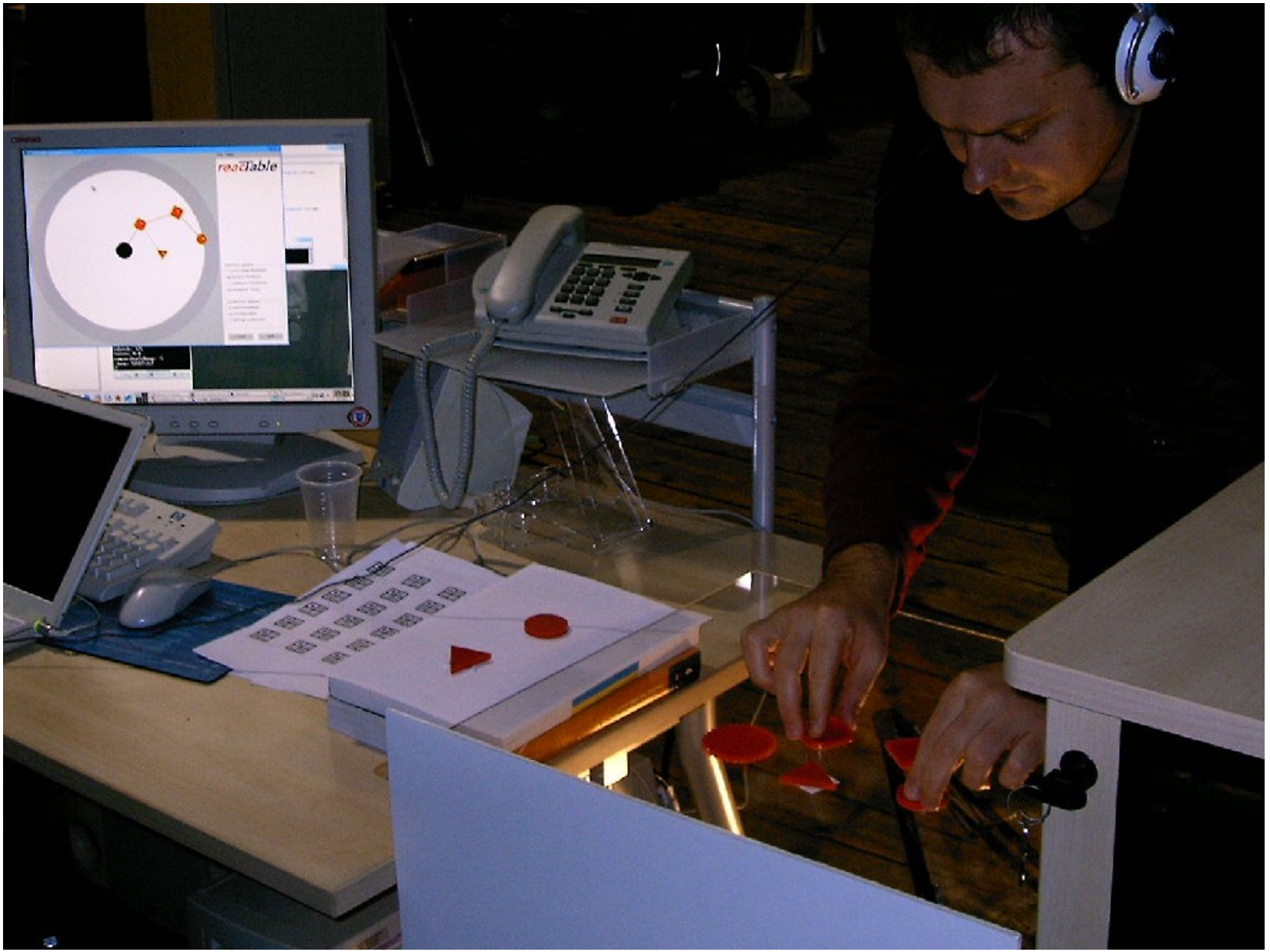
++ reactable - tangible modular synthesizer

++ fundamental inspirations



++ Björk tour, BBC 2007

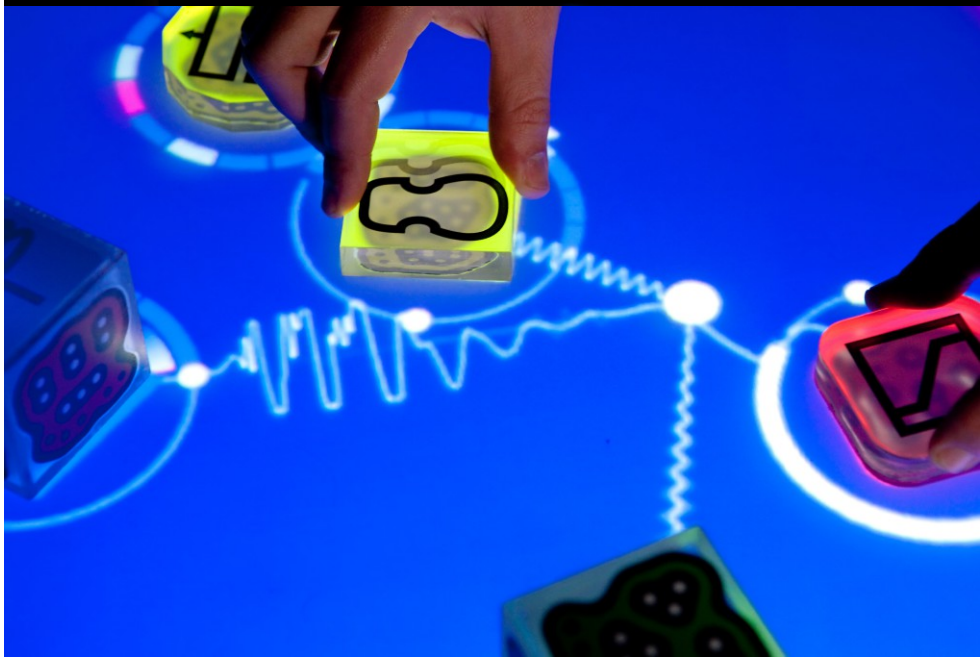
++ first experiments, Medialab Europe 2003



++ first public prototype, NIME 2004

++ first public concert, ARS Linz 2005

++ Reactable Experience



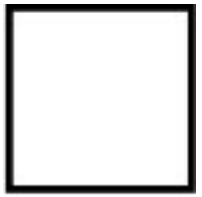
++ Reactable Live!

++ Reactable Mobile

++ shape: generic object classes

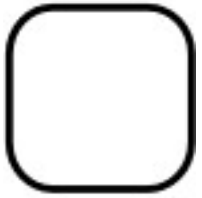
+ sound generators: squares, cubes

oscillators, sound fonts, samples, phys. models



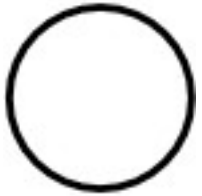
+ sound effects: rounded squares

filter and effects (band pass, delay, distortion ...)

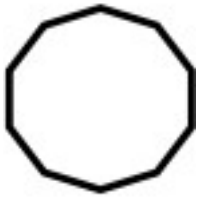


+ control generators: round disks

LFOs, melody generator, random



+ step sequencer: round polygons

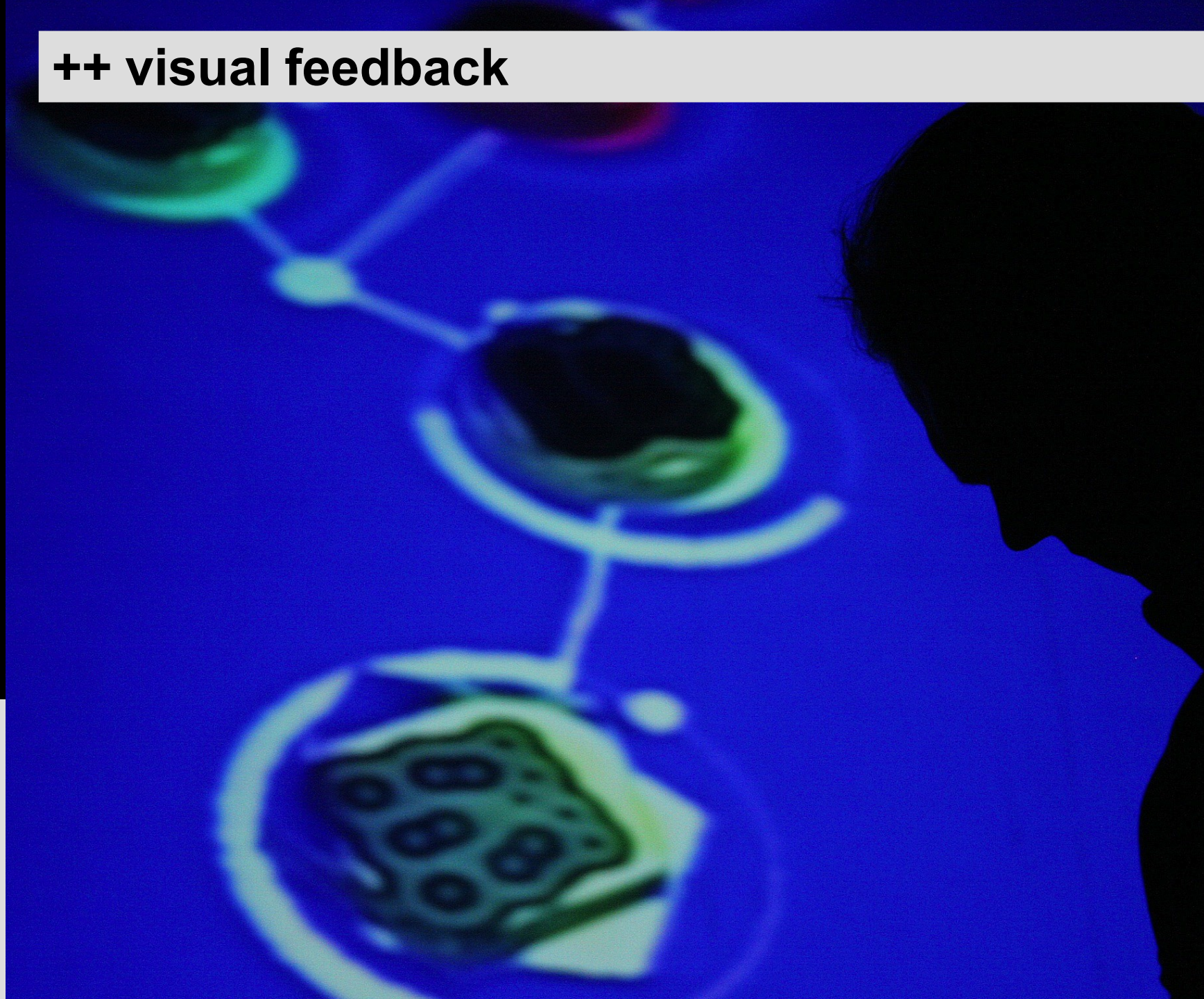


+ global objects: star shape

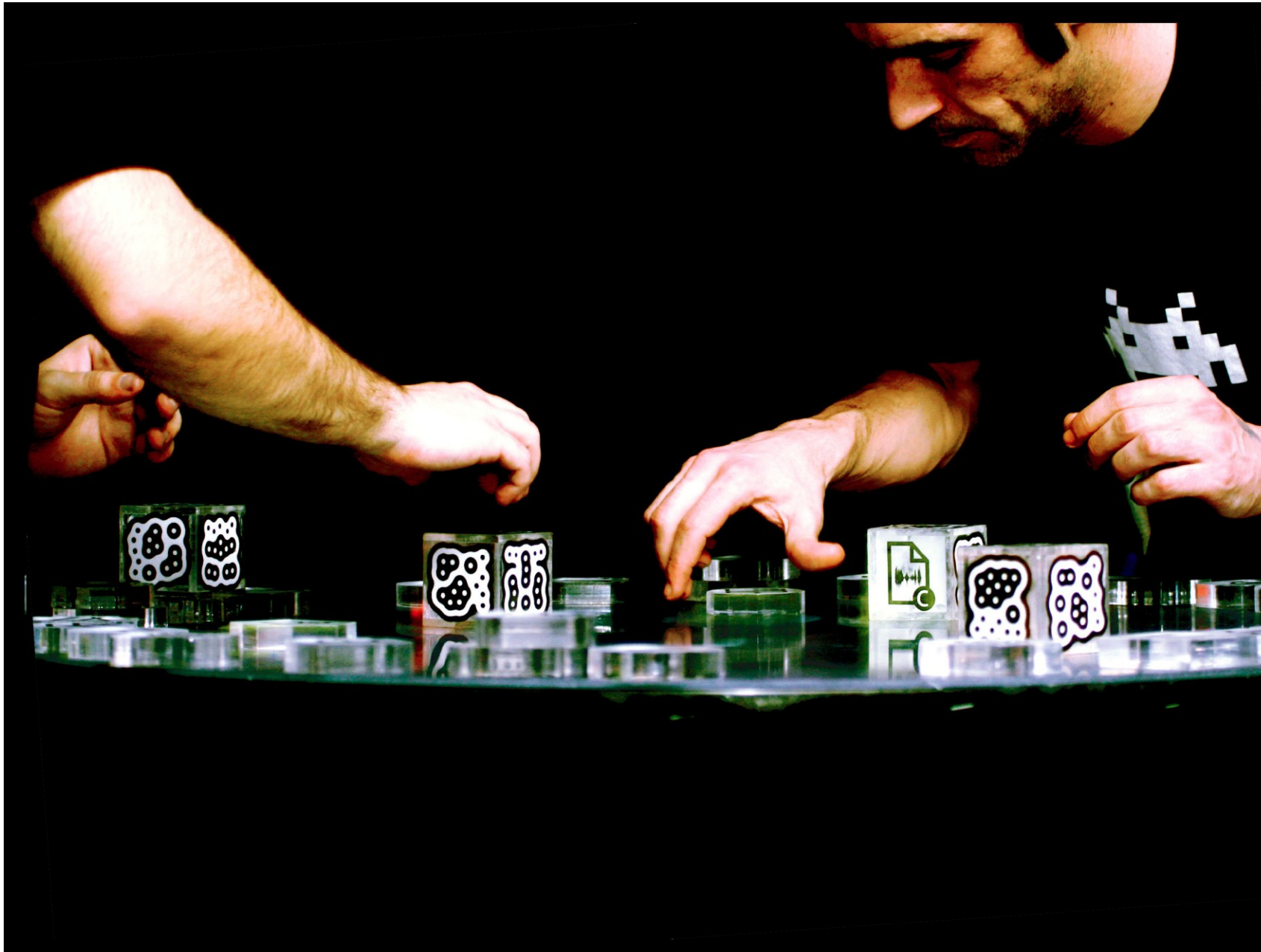
tempo, tonality, volume

++ dynamic patching paradigm

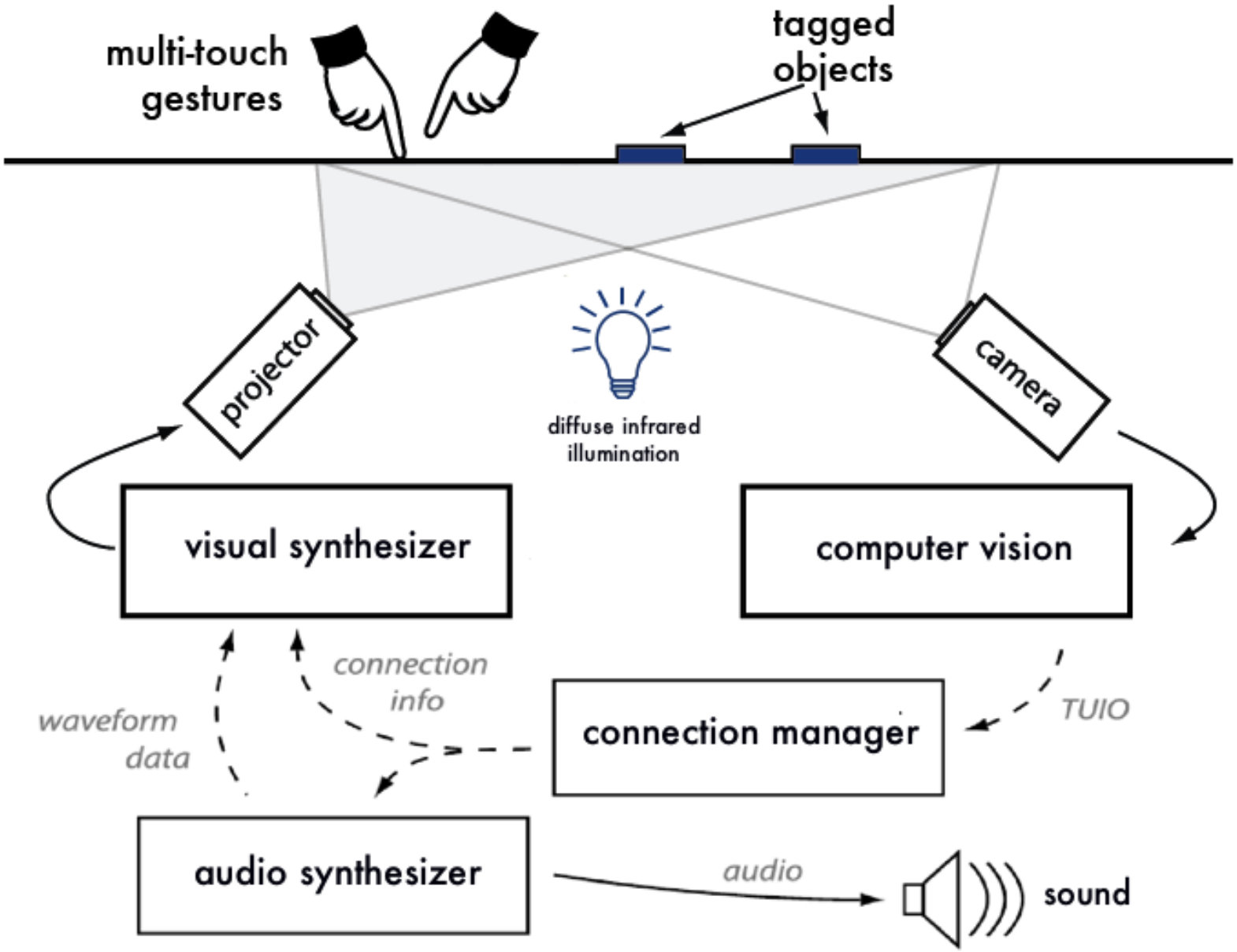
++ visual feedback



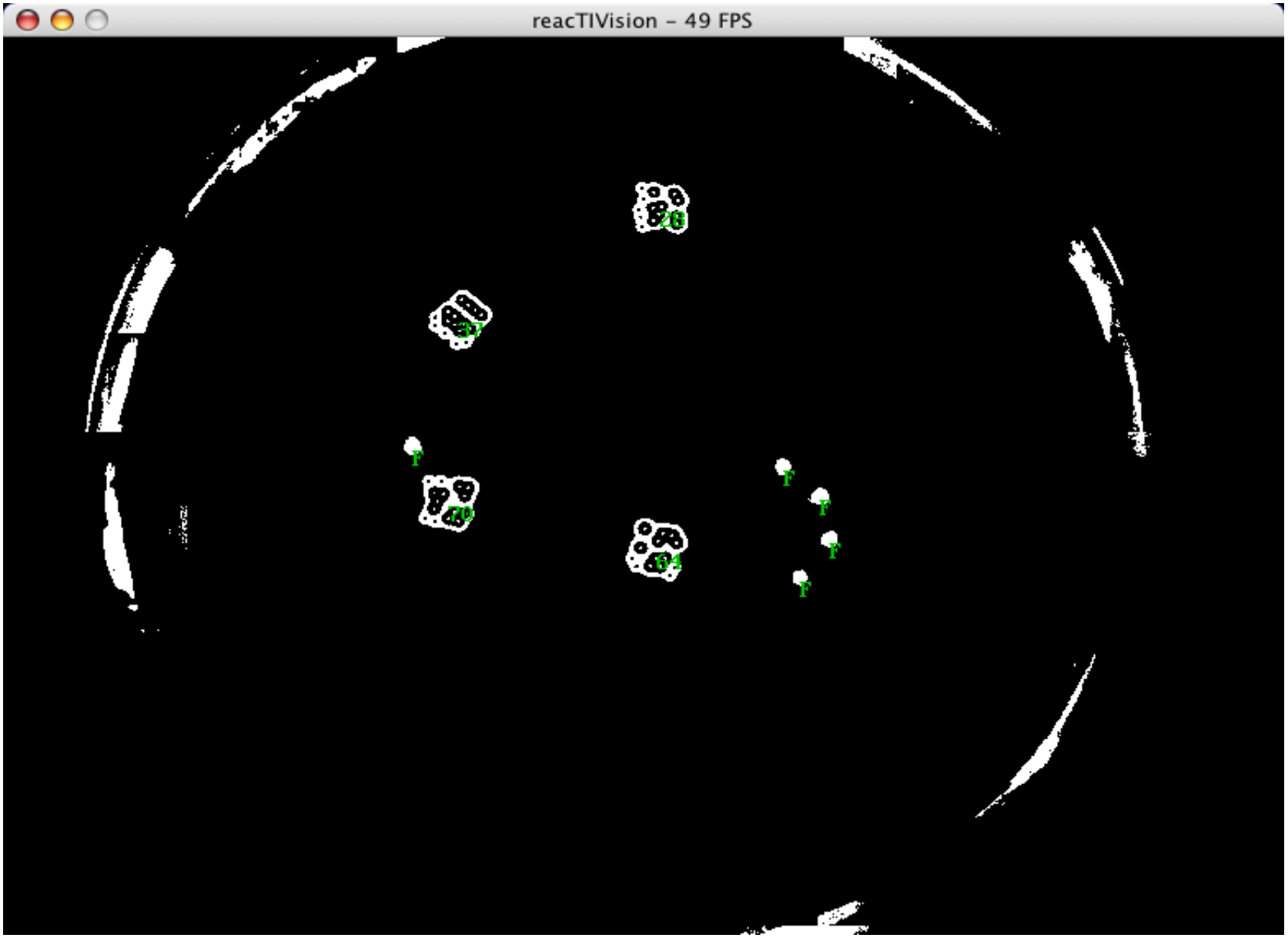
++ collaborative instrument



++ system diagram



++ reacTIVision



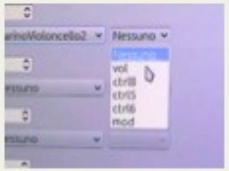
++ community projects

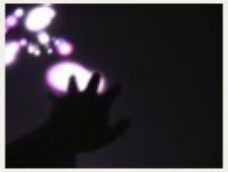
Description 0 likes 0 comments

Ribosound - Concept
by Victor

Stadtplanung
by Fabian Gronbach

Interfaces for Encoura
by JAG


Demo Reactable Ketai
by Dario Freddi


Tuio Kontrol+++multit
by Vision Nocturne

Learn about the RGB
by YUFANGISED

Learn about the RGB
by Harsha Vardhan

Block Environment
by Amee

reacTIVision

182 videos / 138 subscribers

This channel is a showcase for tangible interface projects made with the reacTIVision toolkit.
reactivision.sourceforge.net/

Another list of tangible musical interfaces made with reacTIVision:
modin.yuri.at/tangibles/?list=7

Facebook page: facebook.com/reacTIVision

Settings

Unsubscribe

Share

Moderator

Martin Kaltenbrunner - Creator
Created October 2009
4 videos / **292** likes / **197** contacts

Shout Box

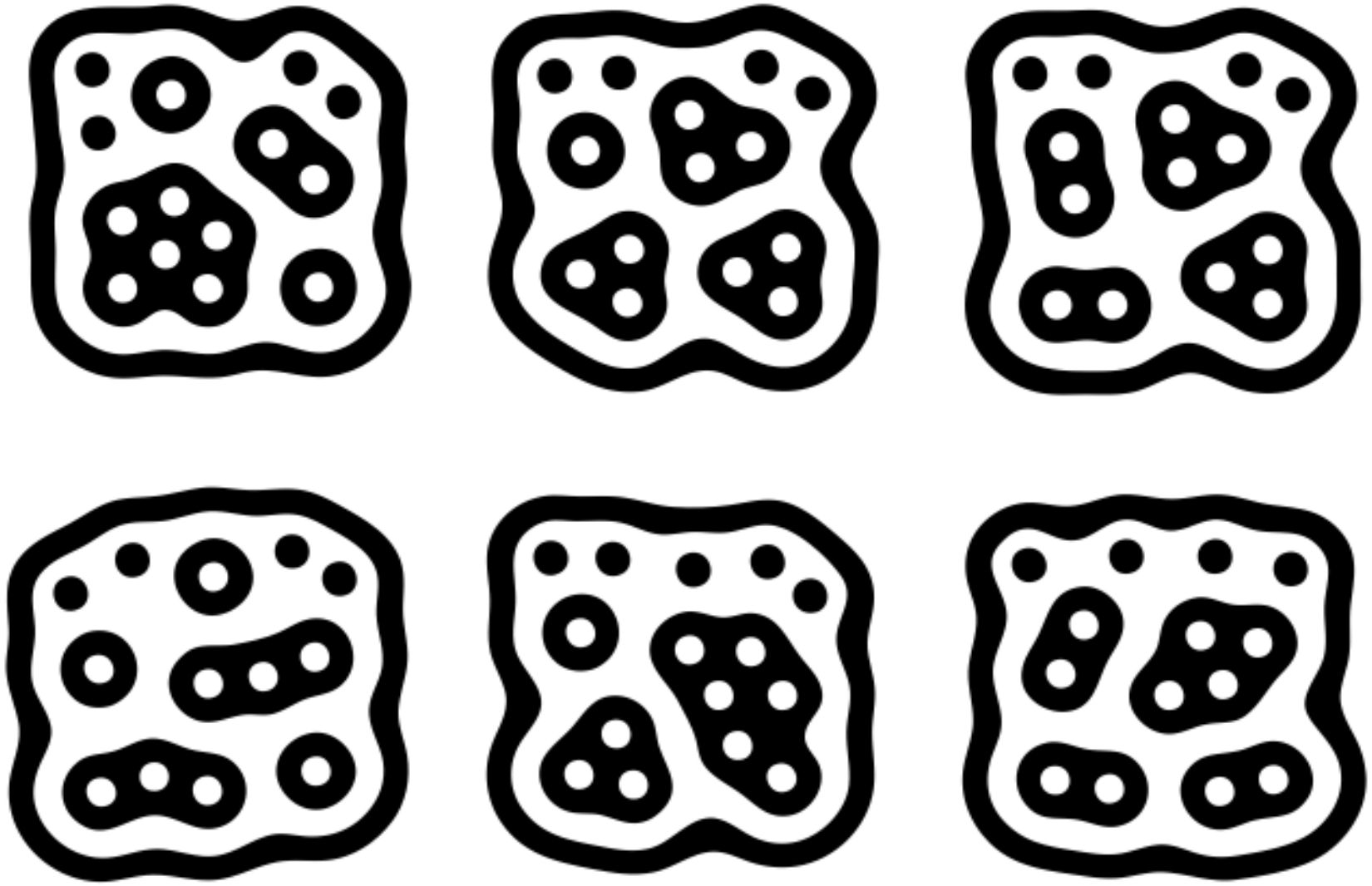
Thanx for adding the vid to your channel... And thx for your great reacTIVision framework of course!!!
Posted by **Fabian Gronbach** 2 days ago

Martín, gracias por incluir nuestro video!
Posted by **derooted creative agency** 6 months ago

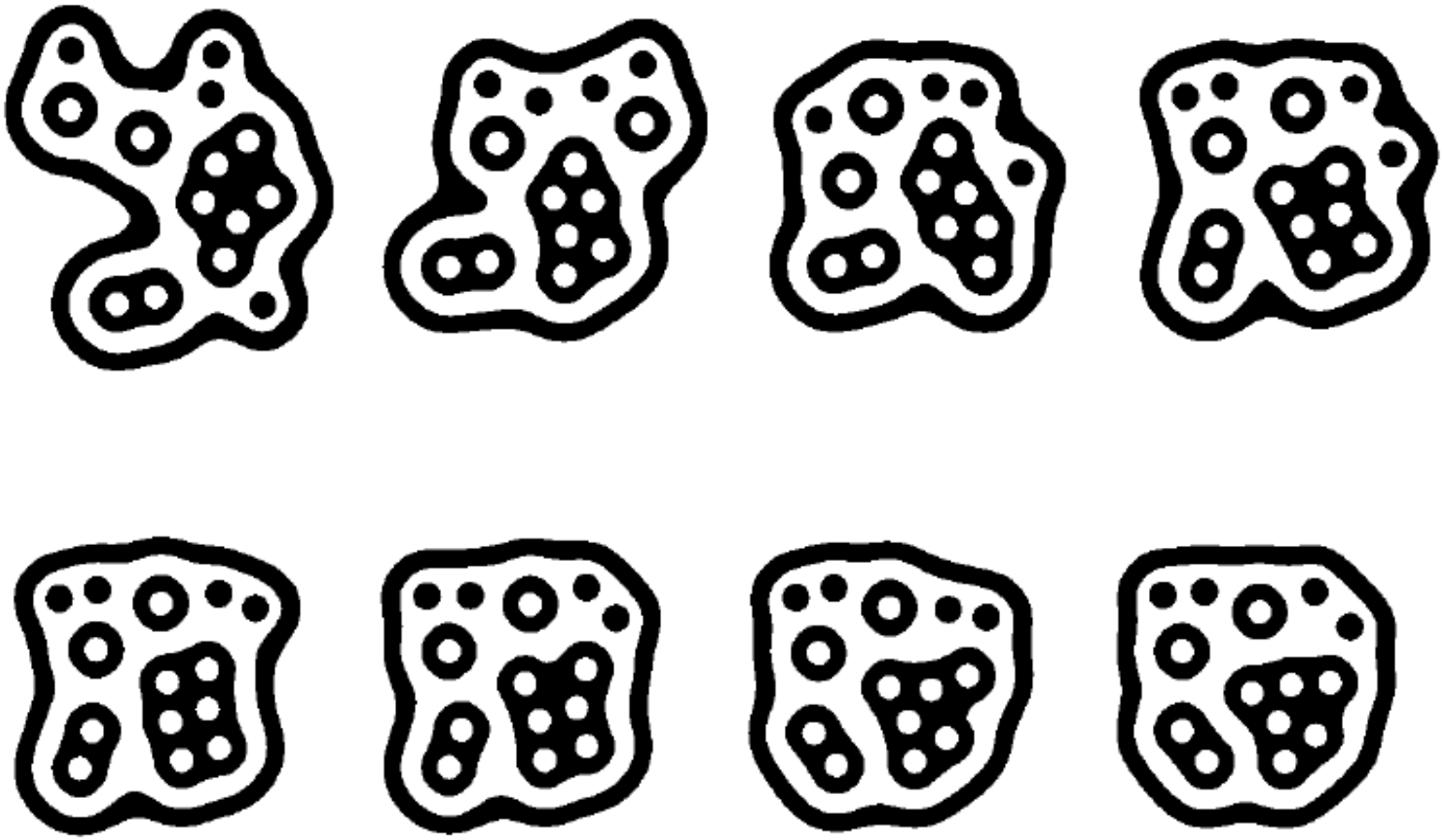
++ student project – Interface Cultures

++ object abstraction

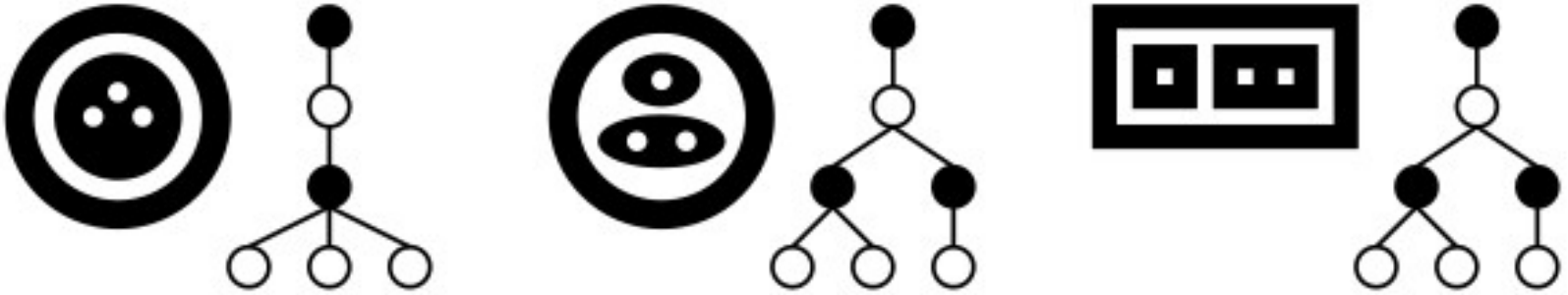
++ amoeba symbols



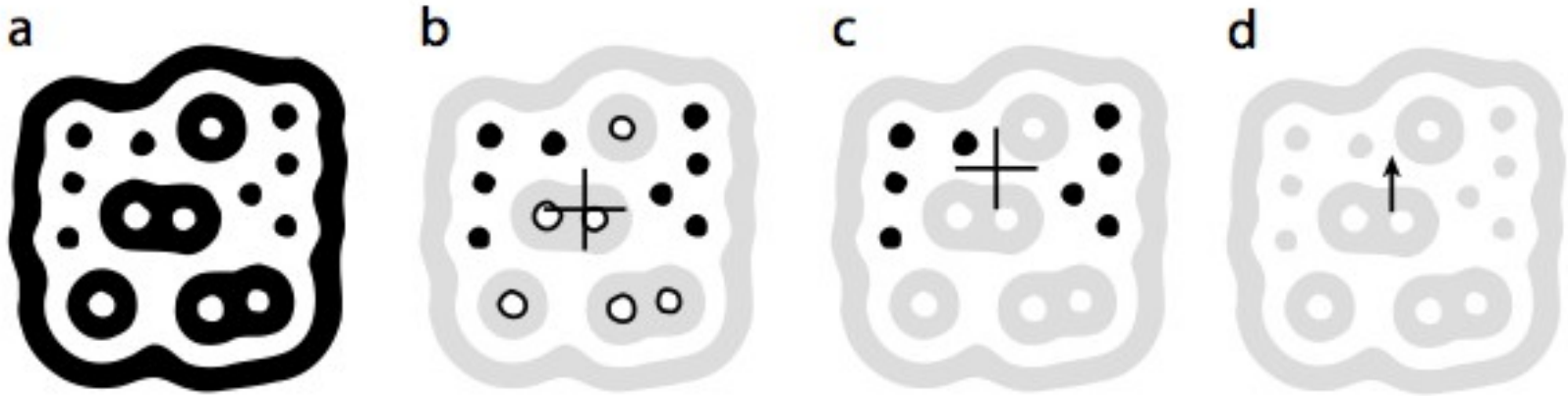
++ fiducial breeding – genetic algorithm



++ region adjacency graph



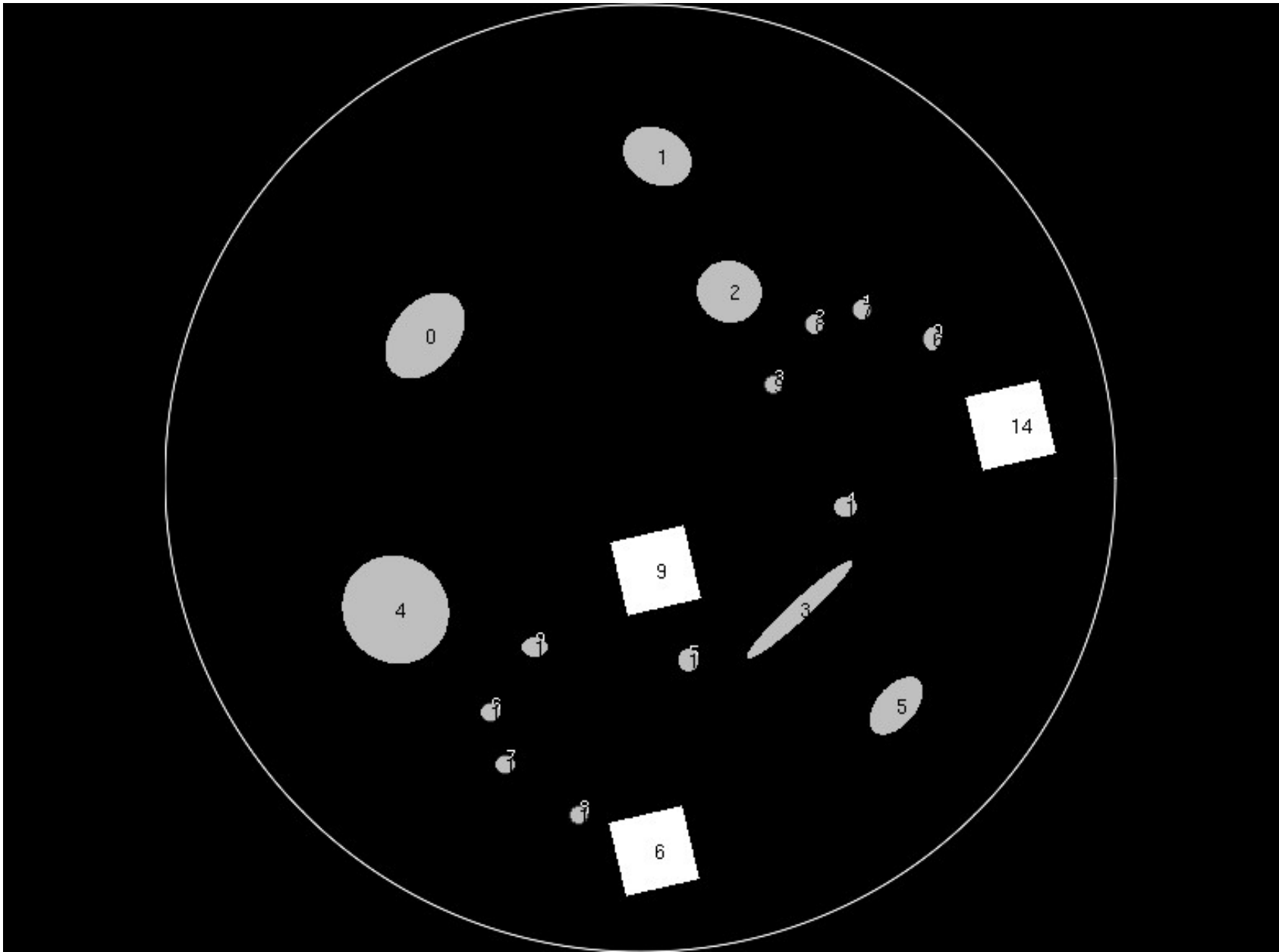
Some simple topologies and their corresponding region adjacency graphs.



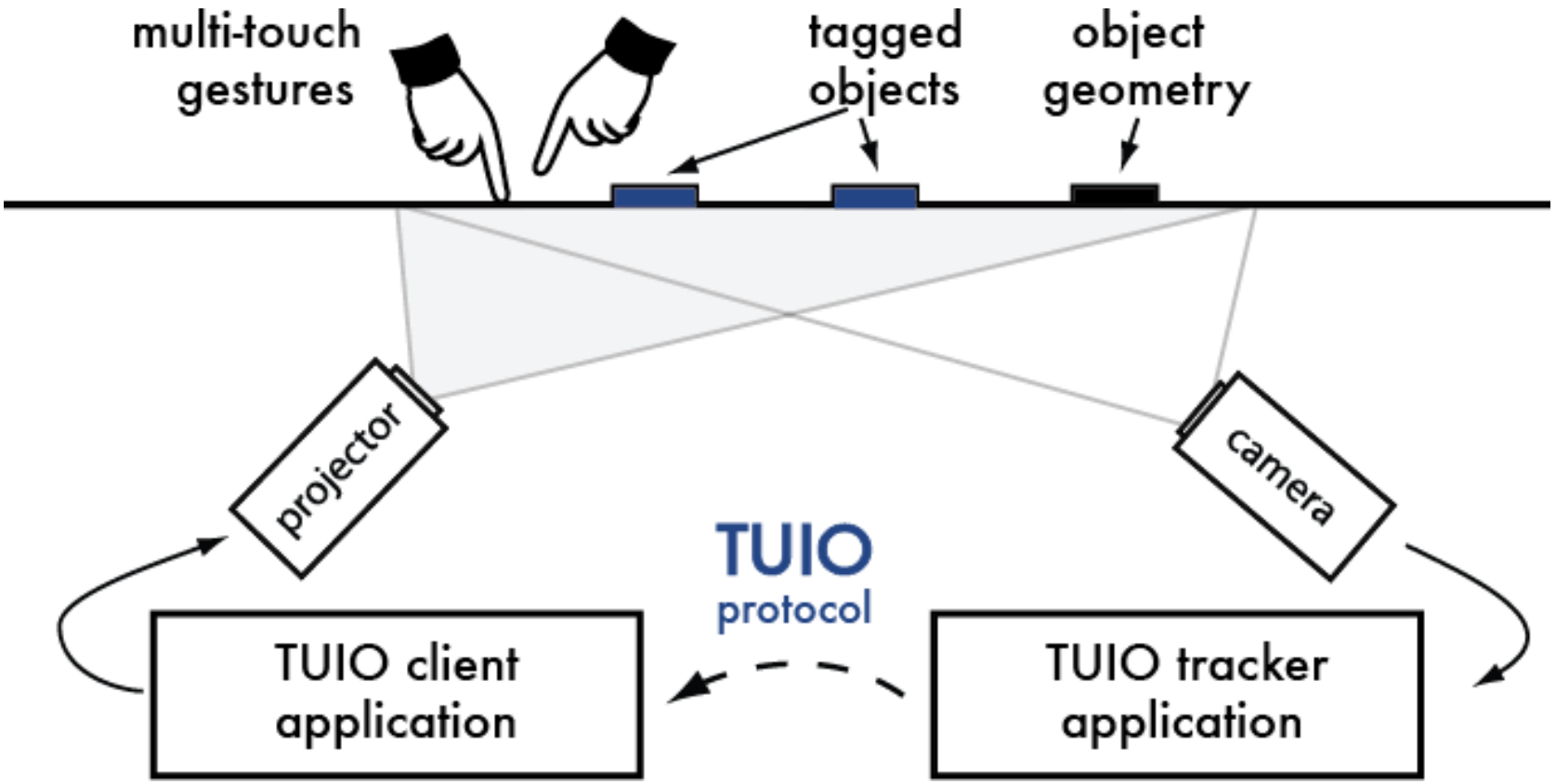
(a) a reacTIVision fiducial (b) black and white leafs and their average centroid
(c) black leafs and their average centroid, and
(d) the vector used to compute the orientation of the fiducial.

++ marker, finger & object tracking

++ token, pointer & geometry abstraction



++ TUIO framework architecture



++ TUIO components

+ original TUIO 1.0

Objects: **/tuio/2Dobj**

describes arbitrary physical objects, which are usually tracked with the help of visual symbols (fiducial markers), RFID tags or similar methods

tokens are not defined by their physical appearance but by their ID encodes position and rotation angle.

Cursors: **/tuio/2Dcur**

describes surface pointers such as finger touches or dedicated devices

multiple pointers are only distinguished by their position

+ extended TUIO 1.1

Blobs: **/tuio/2Dblb**

describes the bounds of untagged physical objects

encodes position, and oriented bounding box (angle, width, height)

can be used to additionally describe the approximate object geometry

++ TUIO 2.0 - tangible abstraction framework

+ revised component definition

Tokens (objects), **Pointers** (cursors), **Geometries** (blobs)

+ additional components

Symbols: allow the encoding of extended symbol content

Controls: for the association of additional control dimensions

Associations: allows description of physical connections & relations

Geometries: Contour, Skeleton, Area ... (incremental detail)

+ extended attributes

e.g. pointers include dedicated pointer/user ID, pressure attribute, ...

tokens allow the use of different symbol types

+ timing infrastructure

for improved gesture recognition capabilities