Tangible Musical Interfaces

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professional background ...

http://interface.ufg.ac.at/
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http://www.reactable.com/
Reactable Systems, Barcelona, Spain
musical instruments 35,000 years ago...
... until the 19th century
the end of the acoustic possibilities
The 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?
decoupling control & sound generation
the need for extended musical interfaces
various types of musical controllers
musical remote control
a musical instrument ...

... unifies control and feedback
Graphical User Interfaces

separate control from representation
++ a typical GUI user

from Igoe & Sullivan: Physical Computing
an abacus ... 

... isn't just a controller device
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
Token based Sequencers

Token-Constraint Systems
Tangible Musical Artefacts

Physical Containers
Building Block Sequencers

Constructive Assemblies
++ fundamental inspirations

osc~ 1234

osc~ 789

dac~

+~
++ first experiments, Medialab Europe 2003
++ first public prototype, NIME 2004
++ first public concert, ARS Linz 2005
++ Björk tour, BBC 2007
++ Reactable Experience
++ 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
++ community projects

Ribosound - Concept
from Victor

ReacTIVision
182 videos / 138 subscribers
This channel is a showcase for tangible interface projects made with the
ReacTIVision toolkit.
reactivation.sourceforge.net/

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

Facebook page: facebook.com/reacTIVision

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

Tuio Kontrol+++multit
by Vision Nocturne

Learn about the RGB :
by YUFANGISED

Learn about the RGB :
by Harsha Vardhan

Block Environment
by Ameex

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
++ 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 leaves and their average centroid (c) black leaves 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

multi-touch gestures

Tagged objects

Object geometry

TUIO protocol

TUIO client application

TUIO tracker application

Projector

Camera
++ 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