The metaphor: *a human size optical pickup head*

- Record groove...
- \( \times 10000 \)
- Free hand drawing, edges of everyday objects

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**3 INSTALLATION SETUP**

The system can be easily configured on a table as was done for 'Sticky Light' or function on a vertical surface such as a wall or a white board for people to doodle freely. Alternatively, the installation can be site-specific and used for real-time augmentation of sculptures or architectural landscapes. Also intriguing is the possibility of augmenting stage performances in real-time for instance by projecting the laser over the floor or even over dancer's clothes or tattooed skin.

**4 CONCLUSION**

We have presented here an experimental device capable of generating rich sound synchronized with moving lights from the shape of drawings or from the edges of three-dimensional objects. It is too early to decide whether "scoreLight" can be effectively exploited as a musical instrument in the vein of 'reacTable' for instance, but we believe that the platform is interesting per se. With a few strokes, anyone can produce enjoyable, hypnotic rhythms of light and sound.

For video demos, check here: [www.k2.t.u-tokyo.ac.jp/perception/scoreLight](http://www.k2.t.u-tokyo.ac.jp/perception/scoreLight)

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**References**


[3] 'I Levin's online Bibliography of Synesthesia Research [www.stronglistssynesthesia.bibliographys](http://www.stronglistssynesthesia.bibliographys)


Multiple “optical heads”:

- Each spot can be an instrument string or a musical track
- Hierarchy in the spot interaction
  (one spot can modulate the sound parameters of another)
Artificial synesthesia?

...to harness the power of a pure graphical language

Bouba/Kiki Effect
(first described by German-American psychologist Wolfgang Köhler in 1929).
of course we are not the first and certainly not the last to try this...

Oscar Fischinger sound scrolls (circa 1930)

Variophone (Evgeny Sholpo in 1930)

Golan Levin “Scrapple” (2005)

reactTable (modular synthesizers)

(in collaboration with Philippe Chatelain)

- sweeping laser line over Philippe’s paintings (rotating)
- people as “scratches” over a vinyl...

**Problem:** difficult if not impossible to create an usable mapping
* Pitch controlled by the inclination of the lines: rotation = transposition
* Pitch is continuously modulated by the curvature of the lines: kiki/bouba effect
* Corner detection: discrete sounds.
* Bouncing on lines: percussion, rythms
* Interaction between spots and intermodulation: effects control
Bouncing mode
Low level sound mapping for granular synthesis

(Daito Manabe)
Feedback on the pick-up dynamics...
Working principle

(a) (b) (c)

(originally used for gesture tracking)

Wednesday, June 30, 2010
Main features of the “smart laser projector”:

- no camera, no image processing
- sample rate: 50 to 500Hz -> granular synthesis!
- perfect image registration by construction
- markerless tracking up to 3m/s
- miniaturization possible (MEMS)
- can write alphanumericic data back (useful for controllers)
scoreLight table configurations
top:
smart laser projector

bottom:
synthesizer, speakers and subwoofer (haptic feedback!)
Spatialized sound configurations

• introduces “extrinsics” position parameters of the drawings in 2d...
...but what about **3d extrinsics**?

- height code for octaves
- slanting a plane score generates inversions

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Wednesday, June 30, 2010

Ishikawa Komuro Lab  http://www.k2.t.u-tokyo.ac.jp/
sculpting sound as pottery
...towards complex sonic sculptures (partially interactive)

Kazimir Malevich’s “Architektons” (ca. 1920),

Suprematist Relief-Sculpture
Jean Pougny (1915)
... or for a performance: *wearing the score?*

Motion on stage can modulate the sound encoded on a printed pattern.
Multilayered tracks

...similar to multilevel recording on a DVD
Summarizing

- artificial synesthesia
- Real time interaction
- Very rich information
- Fast sampling (500Hz)
- compact (size of a barcode scanner)

... but can this be really used as a "musical instrument"?

We are working on this...
Current and future work

As a musical instrument (interaction):

- right balance between control and randomness
- low and high level sound mapping
- track and controllers spots
- dance performance

As a non-interactive piece:

- create paintings/sculptures that also read as a musical score
Very large installations

- interactive games
- augmented architectures, logos, etc
- read the city landscape as musical score

“Laserinne” in collaboration with Jussi Angesleva
Reversing the interaction metaphor: *light arrays* (*)

Haptic Radar (2006)

Hussein Chalayan (laser fashion)

...body worn *laser heads* explore the space surrounding the wearer

HaptiKat (2008)

...technological update of Rebecca Horn “Pencil Mask”?

(*) ongoing collaboration with Danielle Wilde, Jussi Angesleva and Alexis Zerroug

Wednesday, June 30, 2010
Thank you!

www.k2.t.u-tokyo.ac.jp/perception/scoreLight/