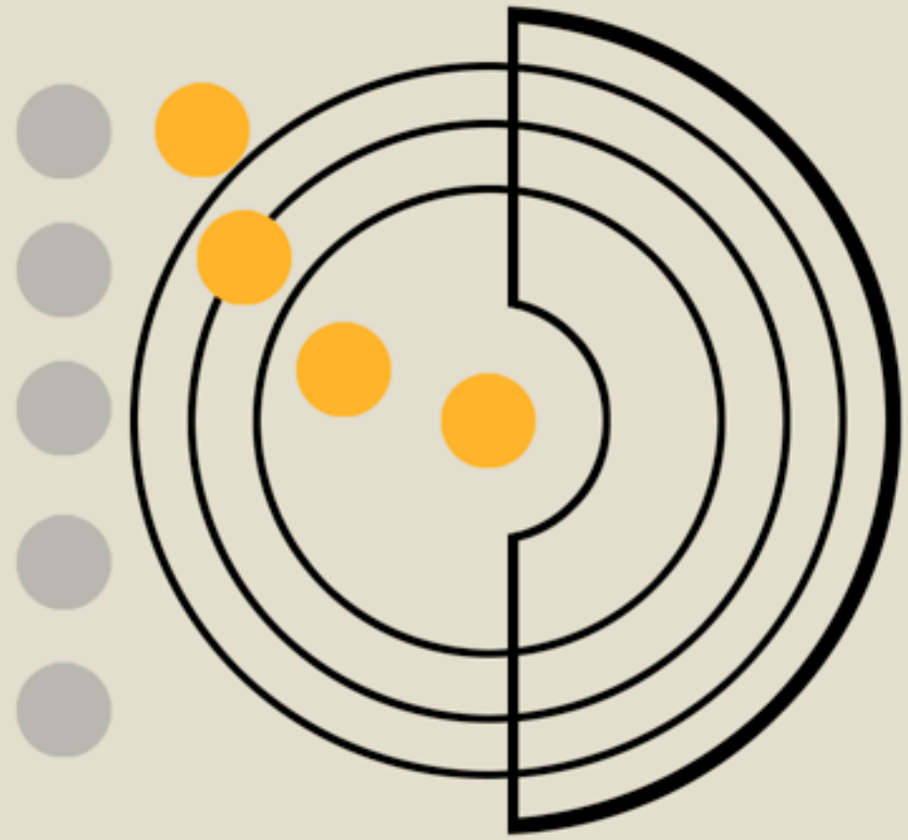
interactive

swarm

orchestra



3D environment for swarm based interactive composition

interactive swarm orchestra

Funding & Partners

Funding: Dore

Domain of Music & Theater

Art: ICST, HMT, Zurich

Martin Neukom

Science: AILab, University of Zurich

Daniel Bisig, John Flury, Jonas Bösch

Economy: tegoro solutions ag, Basel

Christian Rohner

iart interactive ag, Basel

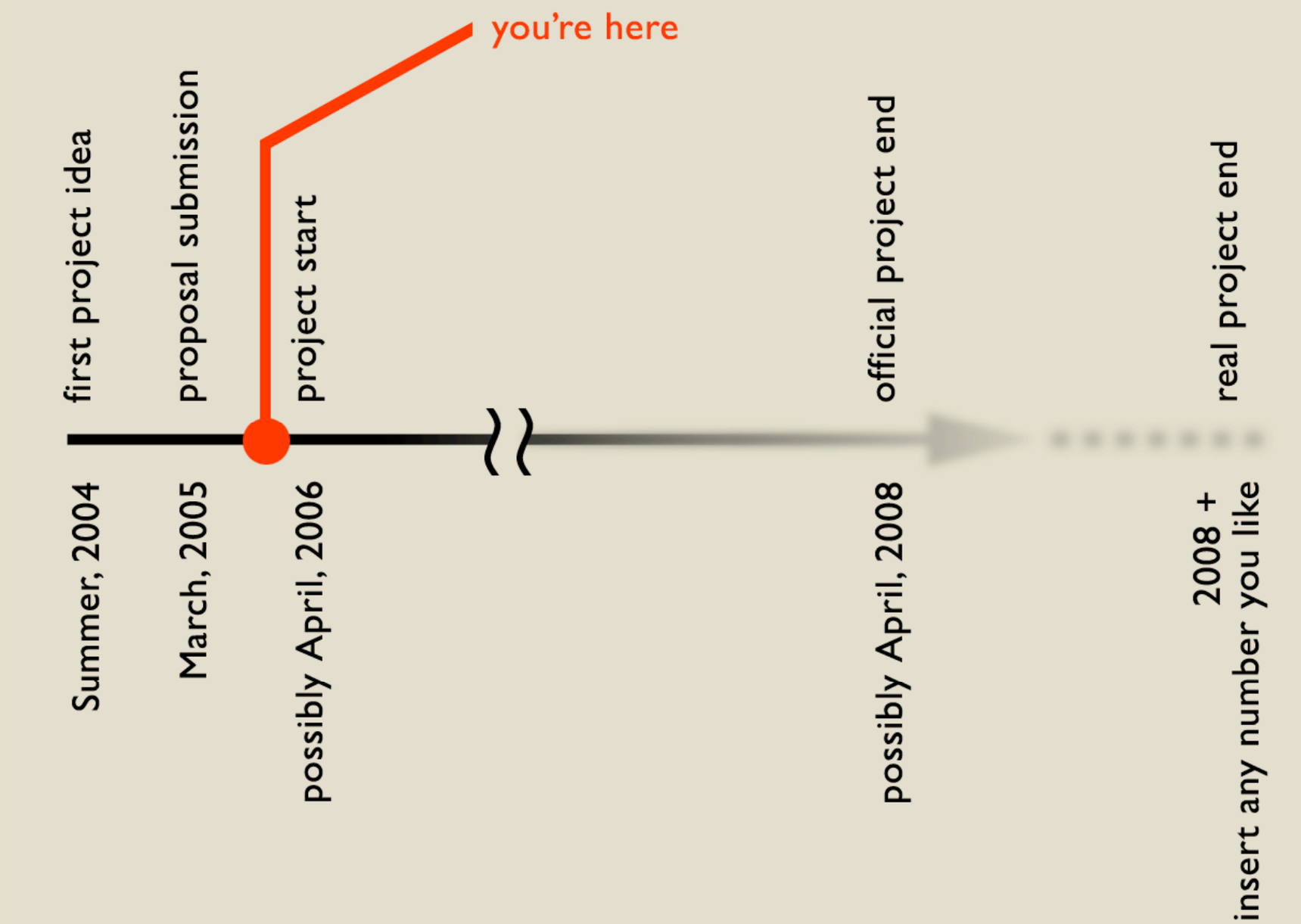
Valentin Spiess

CSEM

Thierry Oggier

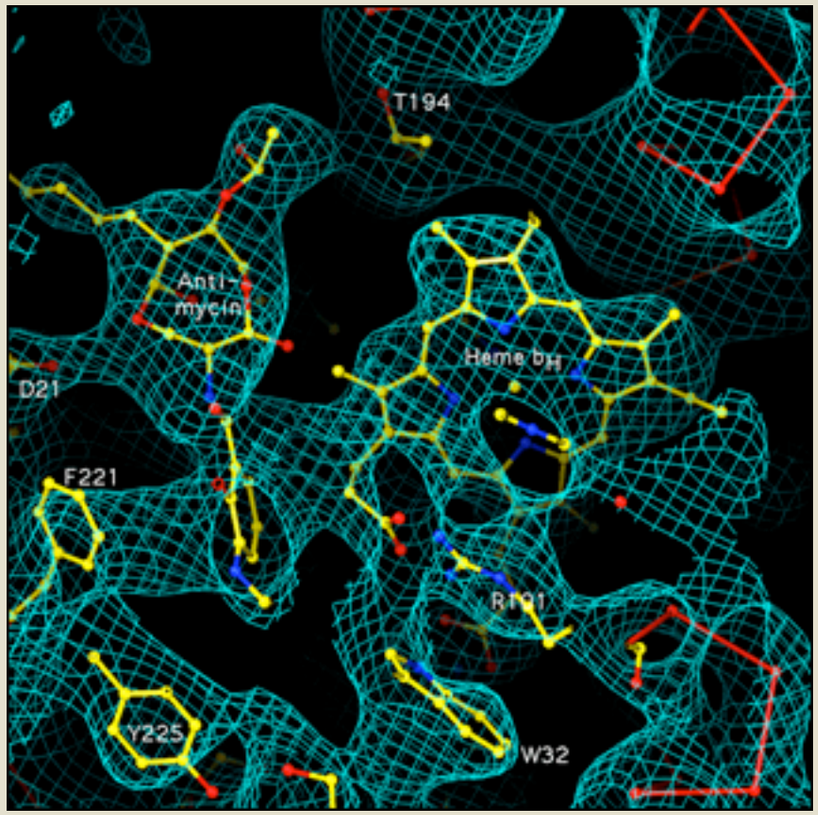
interactive swarm orchestra

Project Outline



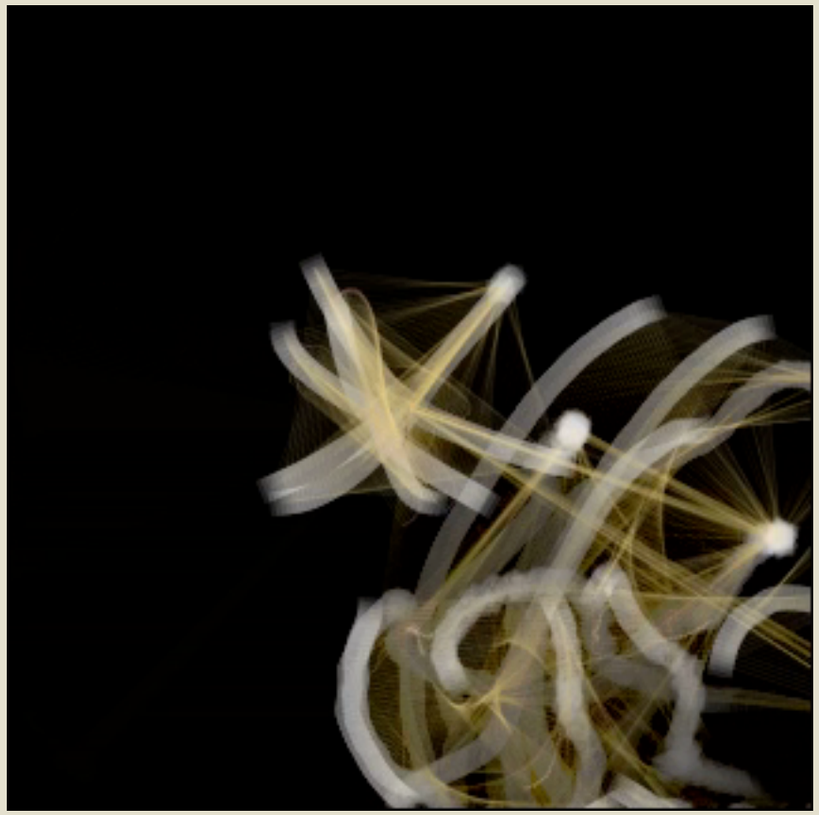
interactive swarm orchestra

Background Daniel Bisig



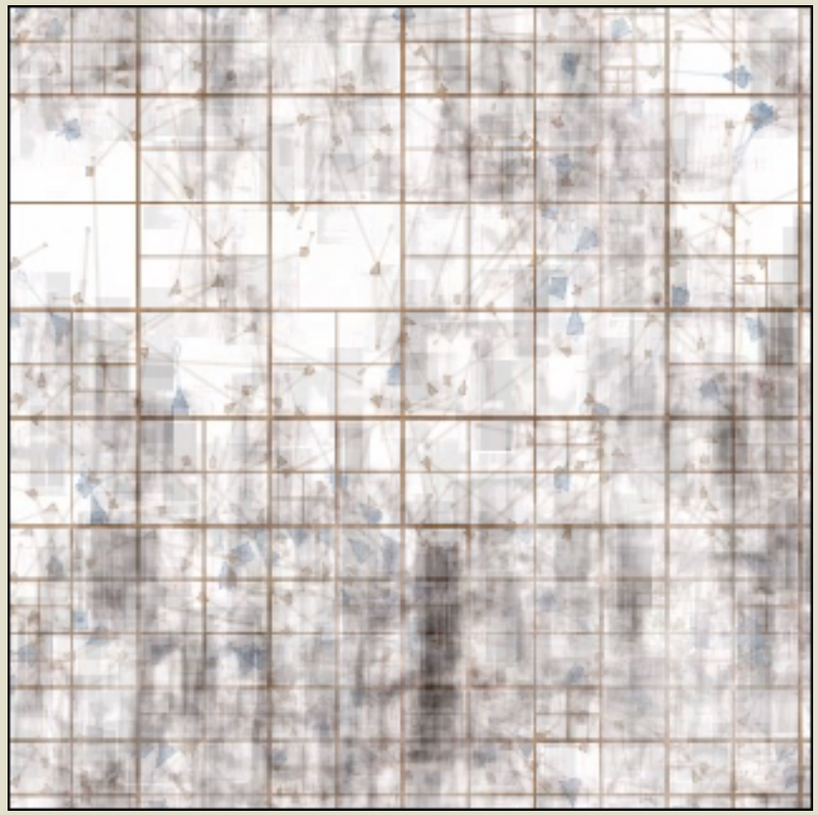
cqbcl

xray protein structure determination



biosonics

interactive growth simulation



mediaflies

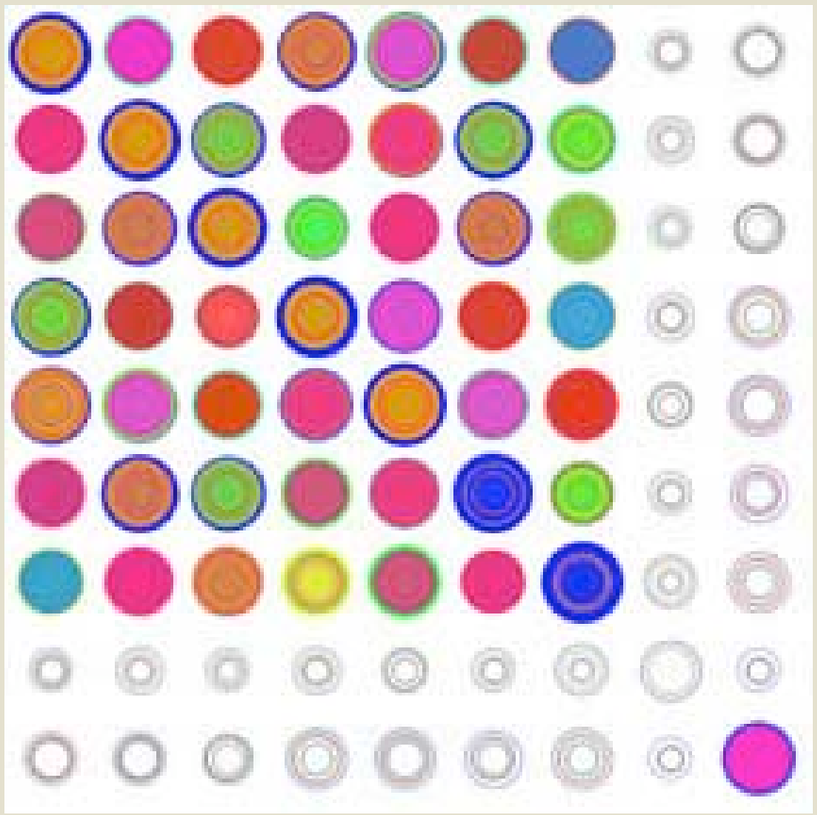
flocking based media remixing

interactive swarm orchestra

Background John Flury

syntharp

string instrument driven
by electro magnets



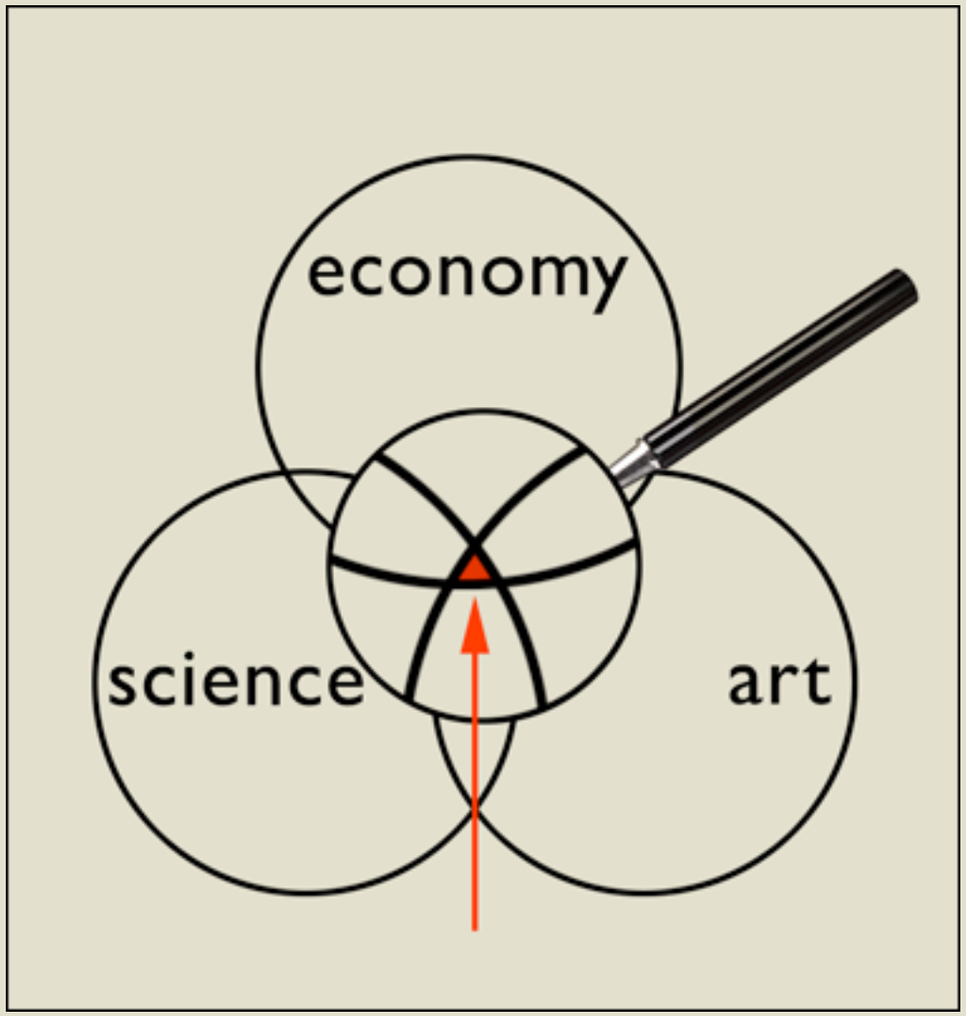
celerina

real-time music generation
system with cellular automata

interactive swarm orchestra

Collaborative Project at the Intersection of Science, Art and Economy

Science	Artificial Life HCI Tracking Psychoacoustics
Art	Sound Synthesis Composition Performance Generative Art
Economy	Acoustical Navigation & Information Data Monitoring



Collaboration

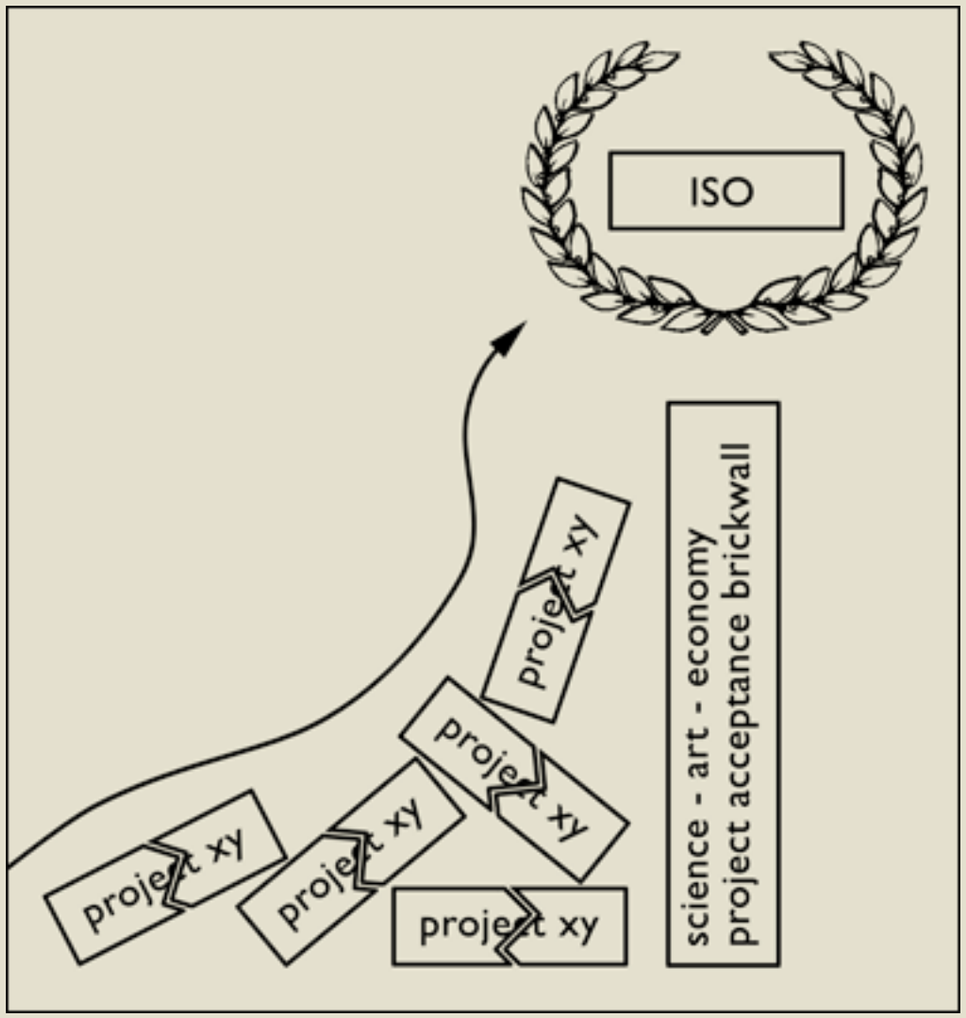
stereotypes

respect & interest

methodologies

common goal

risk



interdisciplinarity versus
acceptance propability

Science Aspects

⊕	⊖
freedom from usability concerns	match or die
differentiation	justification
conceptual extensibility	specialization
focus	
information sharing	
funding	

Art Aspects

⊕

interactivity and subjectivity

different audience

aesthetic criteria

mix & match

exploration and playfulness

different funding

⊖

PR & Connectionism

fake & obscure

Economy Aspects

⊕

reusability

product works

huge audience

huge amount of money

⊖

innumerable constrains

dependence

innovation versus predictability

cost justifications

averaging

interactive swarm orchestra

Collaborative Project at the Intersection of Science, Art and Economy

Collaboration in ISO

ICST ♡ AILab	technology and research oriented art partner & art oriented science partner
iart & tegoro	extend existing solutions (P200, WiFi Tracking) navigation and information aid publication
CSEM	spinoff surprise research collaborations on hold

ISO as Dore Project

insourcing of project aspects	Composition
	Dance
	Psycho-acoustics
funding criteria	Universities of Applied Research.
praxis - partner	Commercial Interest
small budget	theoretical versus real workload

interactive swarm orchestra

Main Conceptual Ideas

swarm simulation

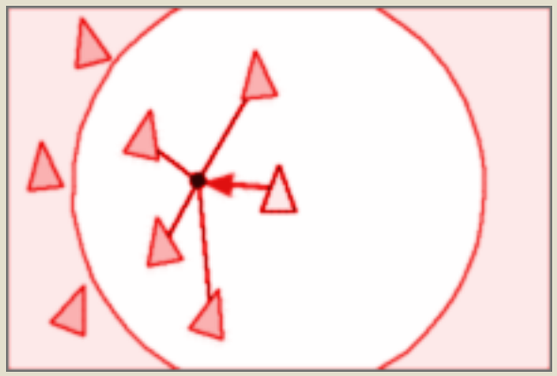
ambisonic sound projection

computer music

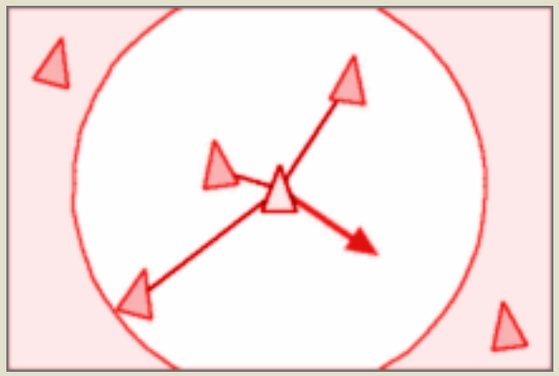
camera based interaction

composition and installation scenarios

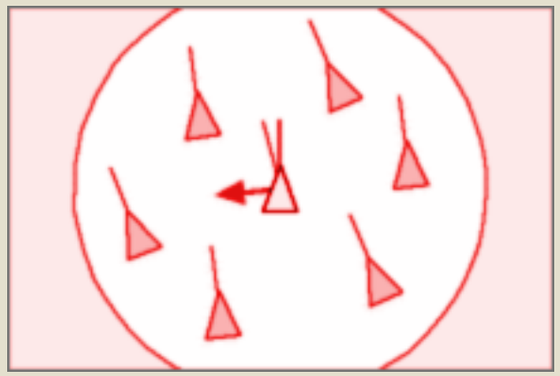
Swarm Simulation



cohesion

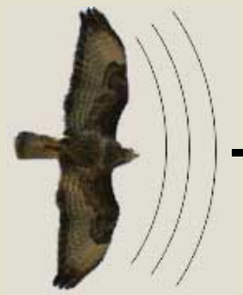


evasion



alignment

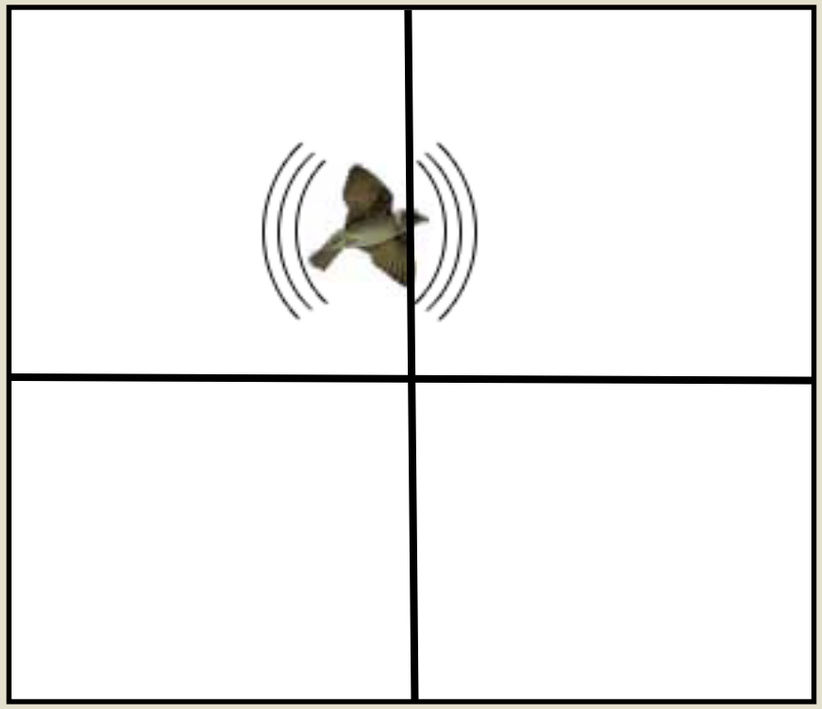
Ambisonic (spatial sound projection)



source sound

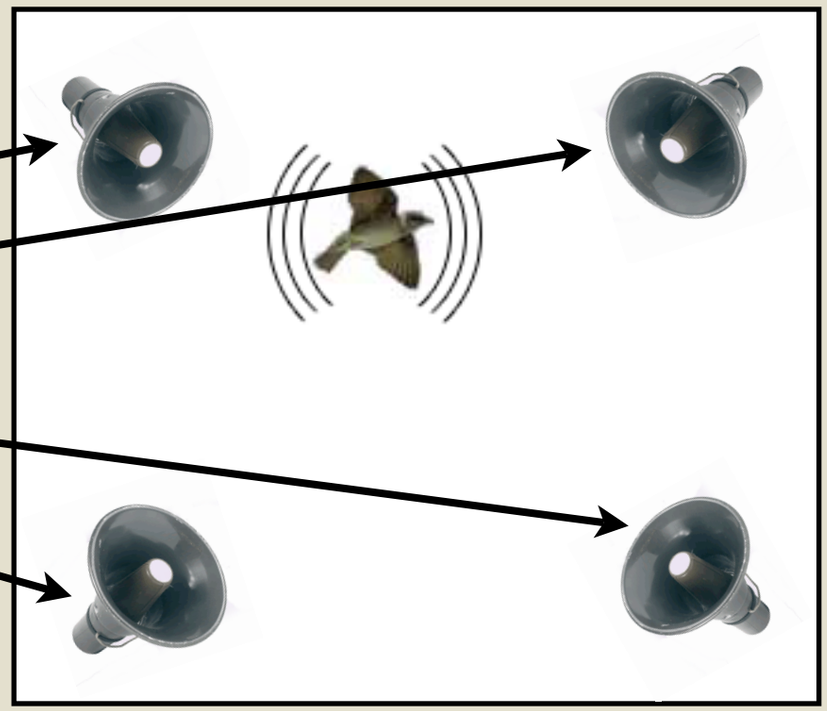
Ambisonic Encoder

spatial location

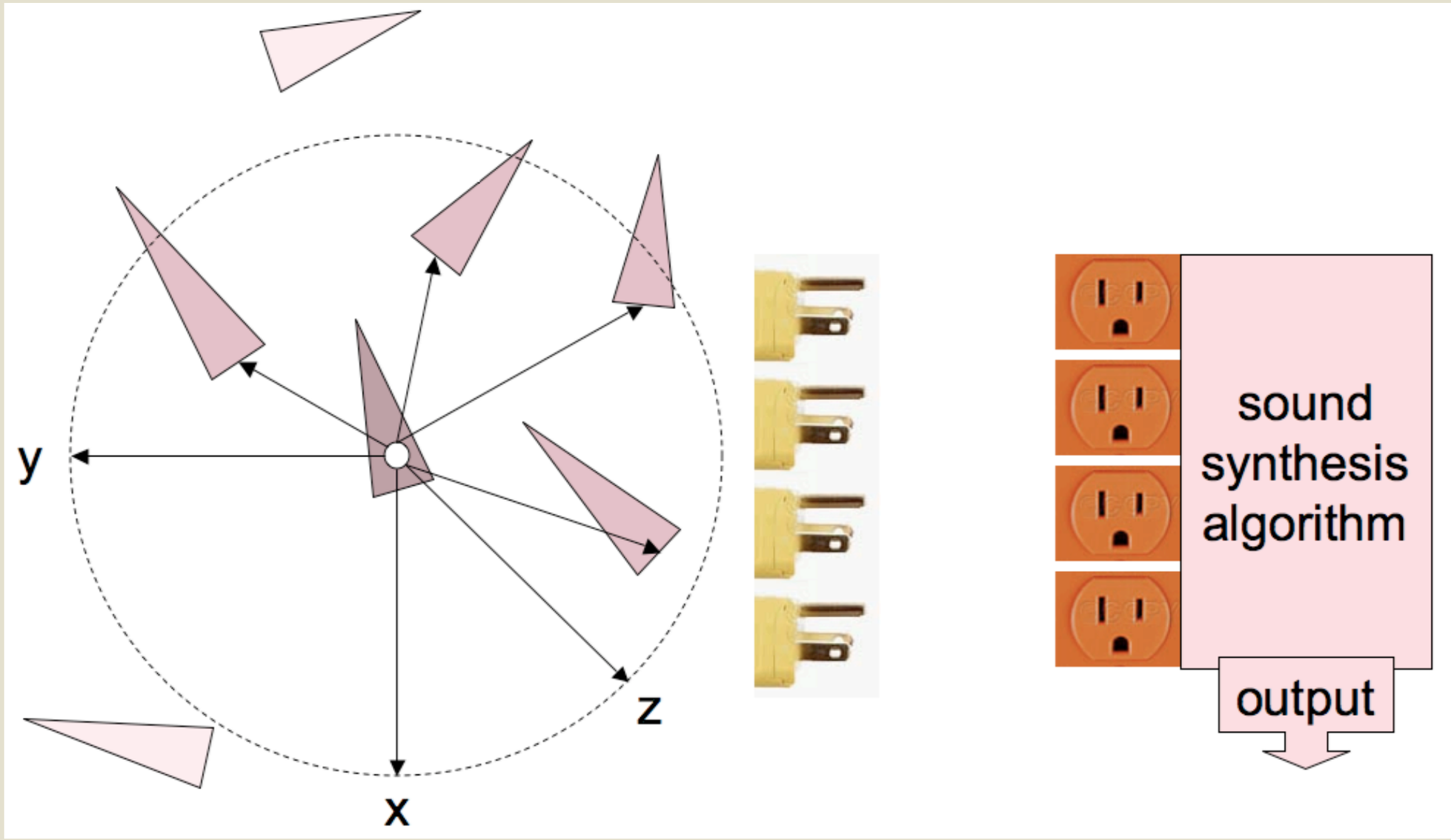


encoded sound stream

Ambisonic Decoder



Computer Music

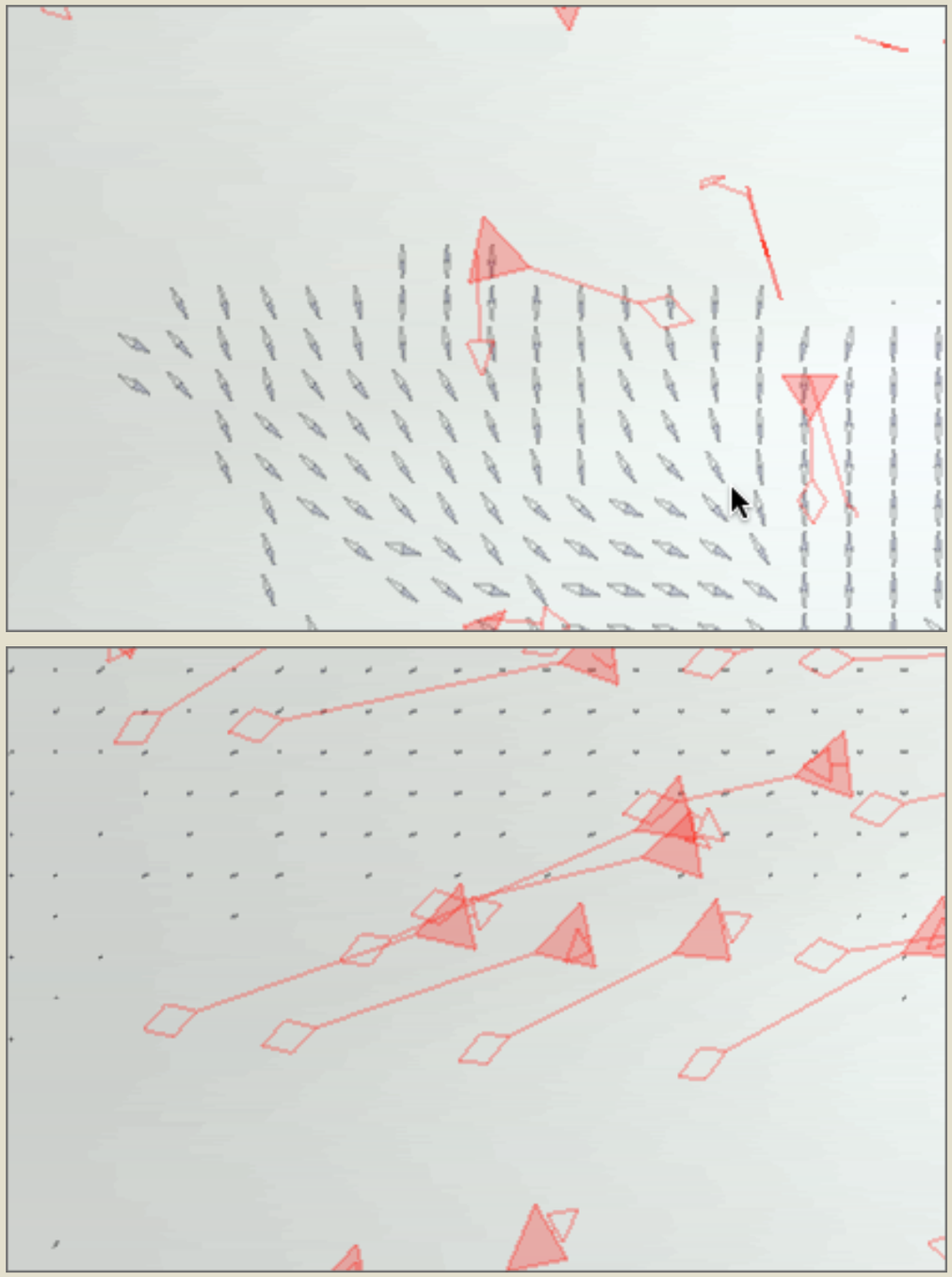


Camera Based Interaction

wireless & cheap & flexible

single and multiple person tracking

kinematics based interaction



interactive swarm orchestra

Open Concepts

swarm sound synthesis

swarm response to interaction

swarm based acoustic navigation

more stuff we simply forgot

Swarm Sound Synthesis

- atomic sound synthesis
  - suitable sound synthesis methods?
- parameter mapping
  - musically meaningful mappings?
  - parameter dependencies?
- swarm analysis
  - arbitrary?

Swarm Response to Interaction

characterization

variety versus confusion

musical superstructures?

habituation

balance reproducibility and personalization?

Swarm Based Acoustic Navigation

acoustic limitations:

audio as information channel

spoken text - music conflicts?

limited spatial audio

de-emphasize 3D sound?

technical limitations:

low processing power

low tracking resolution

low bandwidth

low level programming

cheap sound synthesis methods?

More Stuff We Simply Forgot

any suggestions ?