

HNMMC

July 9-10, 2018
Ircam, Paris

Human-Machine Collaboration in Embodied Interaction

Supported by the H2020 Marie Skłodowska-Curie Fellowship **MIM**

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UMR STMS IRCAM - CNRS - Sorbonne Université



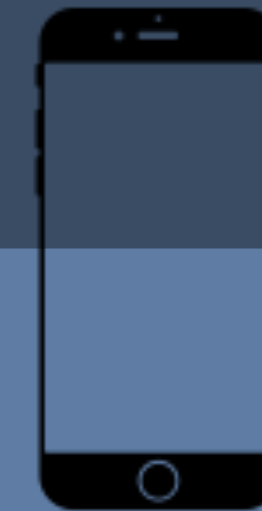
General context

Digital technology influences how we live, and how we interact with each others, how we learn, create, or recover.

From workspace to personal life

From individual to society, nation

Digitisation and ubiquity



Advances in data science



Current model

A photograph of a person in a dark wetsuit carrying a surfboard under their arm, walking away from the camera on a rocky beach. The background features a dramatic sunset with a bright sun low on the horizon, casting a golden glow over a cloudy sky. In the distance, white buildings are visible on a cliff. The text "Make Google do it." is overlaid in large, white, sans-serif font.

Make
Google
do it.

delegation



Alexa interface by Amazon

competition



*Lee Sedol playing against Alpha
Go by Deepmind*

Questioning

Increasing “delegation” of tasks to digital technology

Learning technologies “competing” with humans in complex tasks

Technologies “influencing” behaviour and body perception

Technologies “assisting” creativity and artistic practices

Background

{Sound Music Movement} Interaction

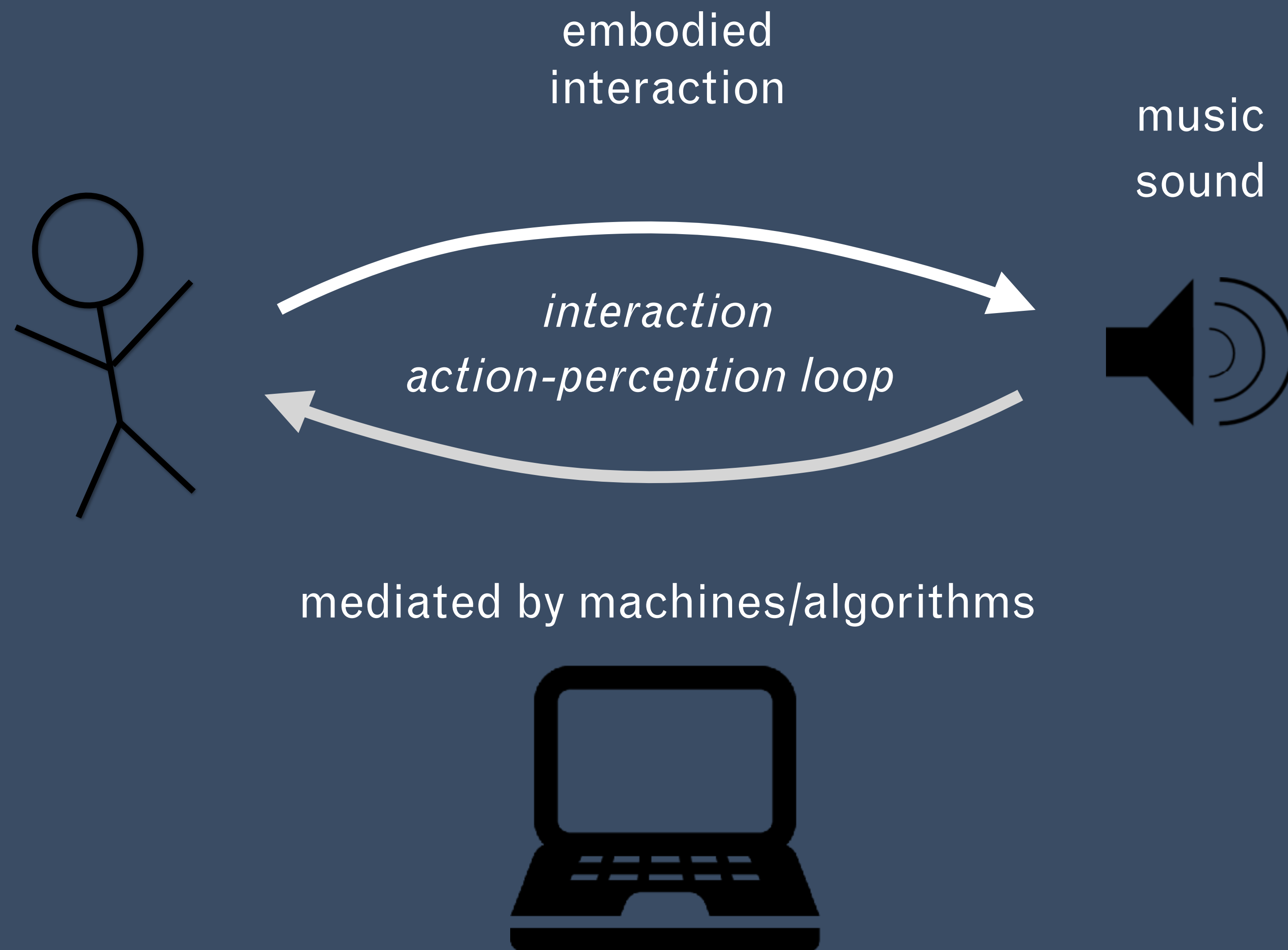
Frédéric Bevilacqua, Riccardo Borghesi, Diemo Schwarz, Baptiste Caramiaux,
Benjamin Matuszewski, Jean-Philippe Lambert, Hugo Scurto, Pavlos Antoniadis,
Bavo Van Kerrebroeck

<http://ismm.ircam.fr>

IRCAM Centre Pompidou
STMS Ircam-CNRS-UPMC

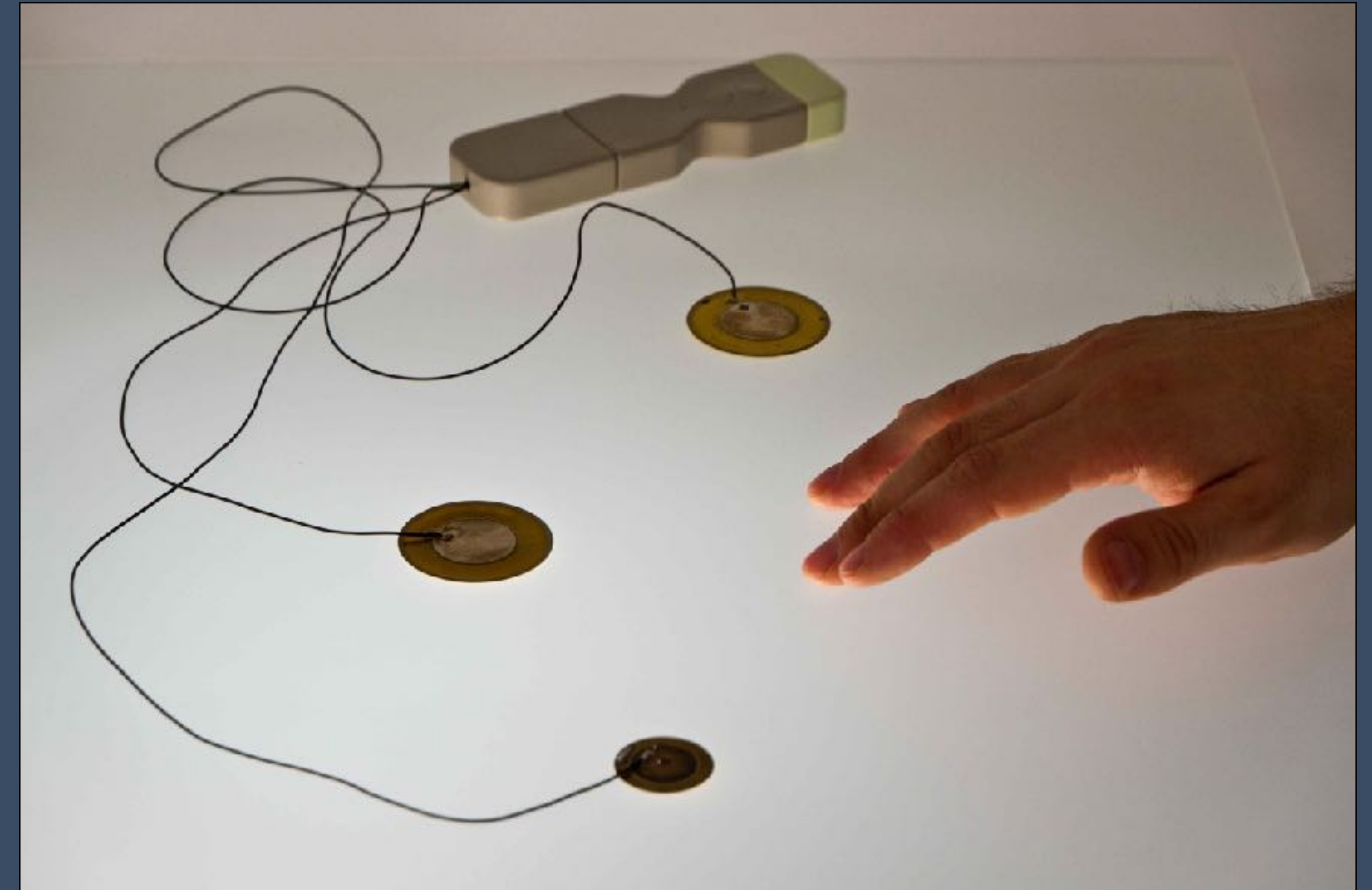


Movement-Sound Interaction



Tangible Interfaces for Music

MO – Modular Musical Objects



1st prize at the 2011 Margaret Guthman Musical Instrument Competition
International Design Biennial, St-Etienne 2010
Talk to Me, MoMA – NY 2011
Award “Societal Impact” from the French National Research Agency

Public Installation

Collective Loops (ENSAD-Ircam)



Pedagogical Workshop

Philharmonie / Orchestre national des pays de la Loire



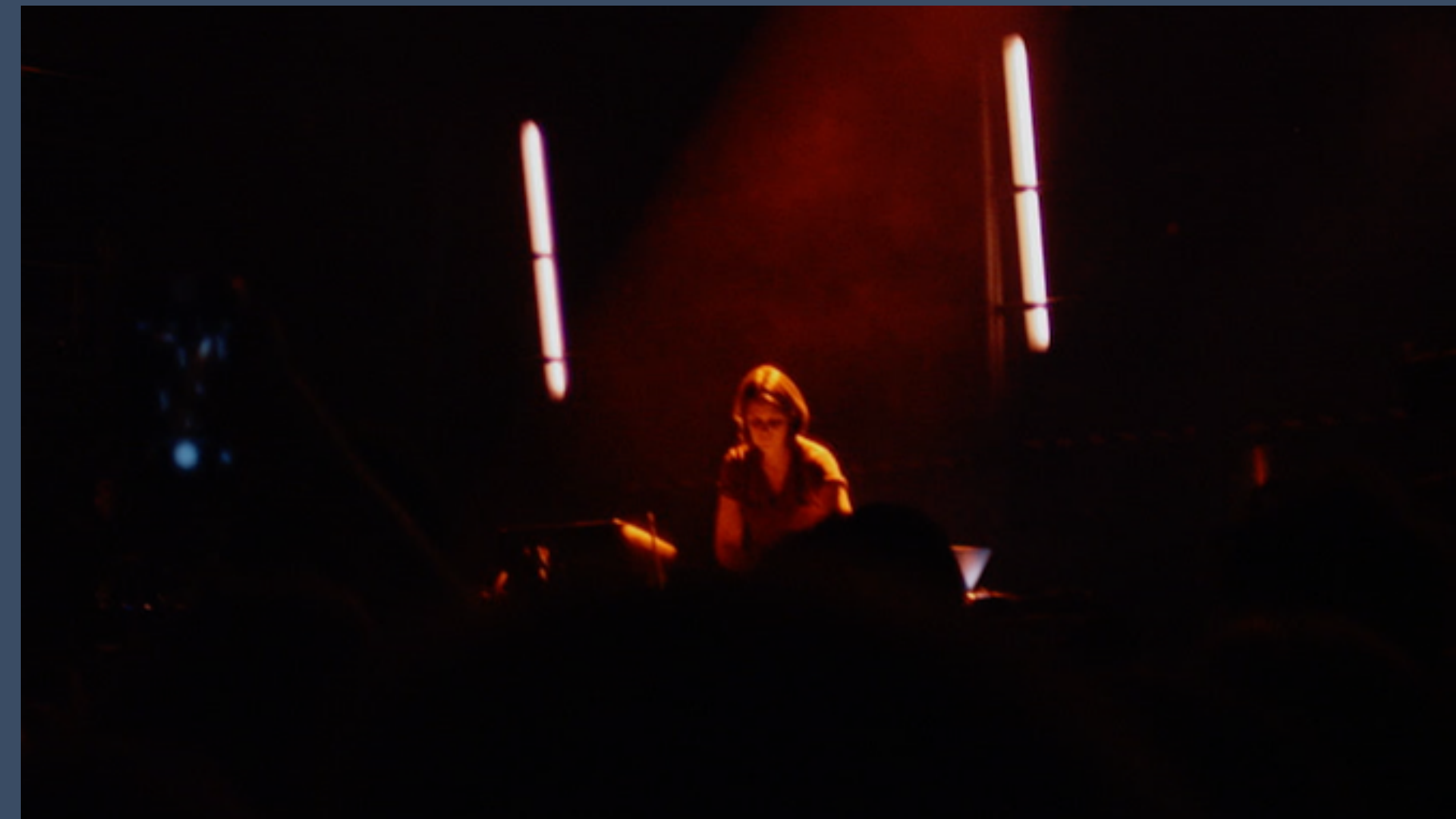
Collaborative Instrument

Coloop - NoDesign-Ircam)



Concert with Audience Participation

Chloé X Ircam (2015)



Collaborative Interactions

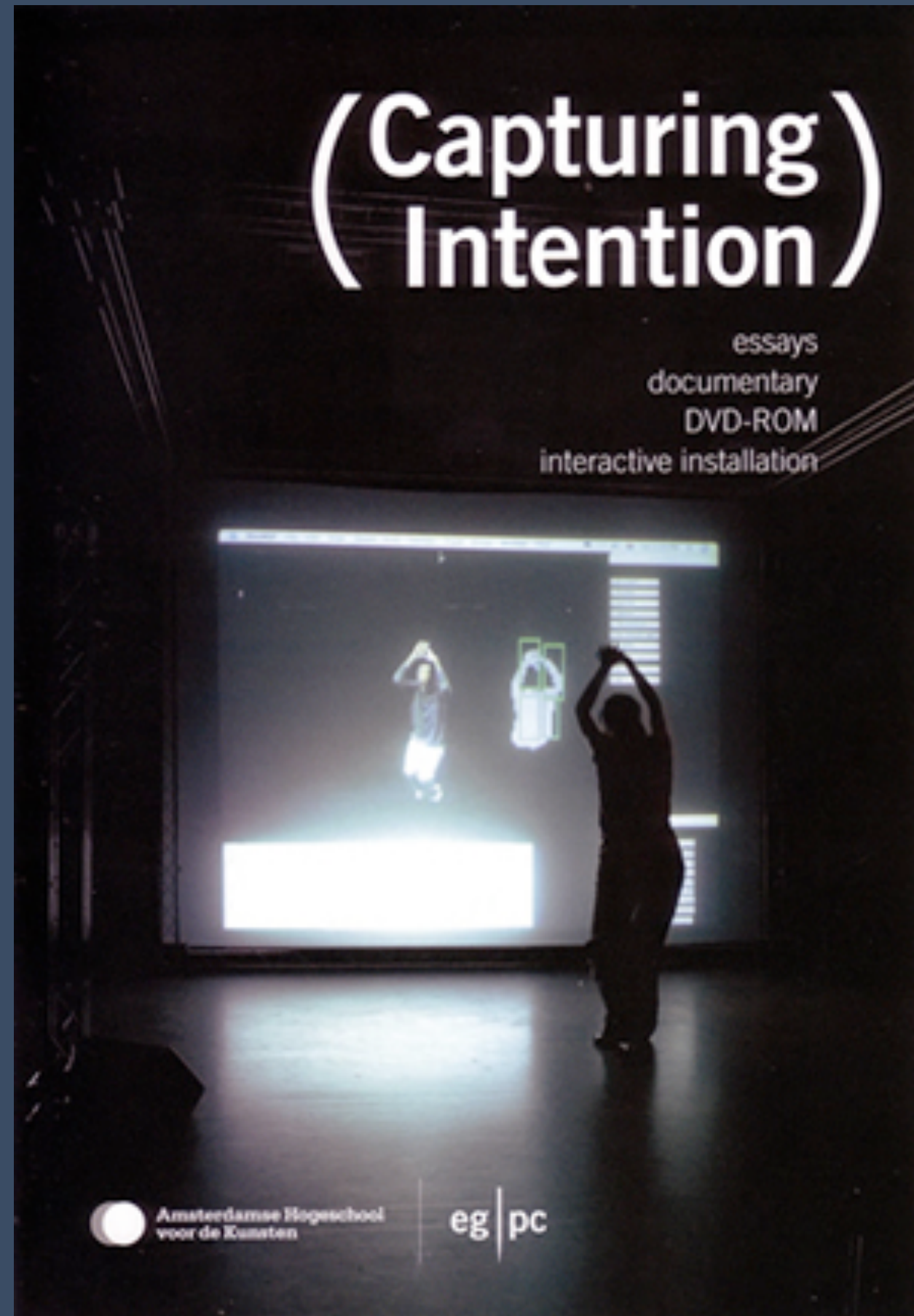
Urban Musical Game – Festival Futur en Seine

IRCAM, NoDesign, Phonotonic, Andrea Cera 2011



Learning

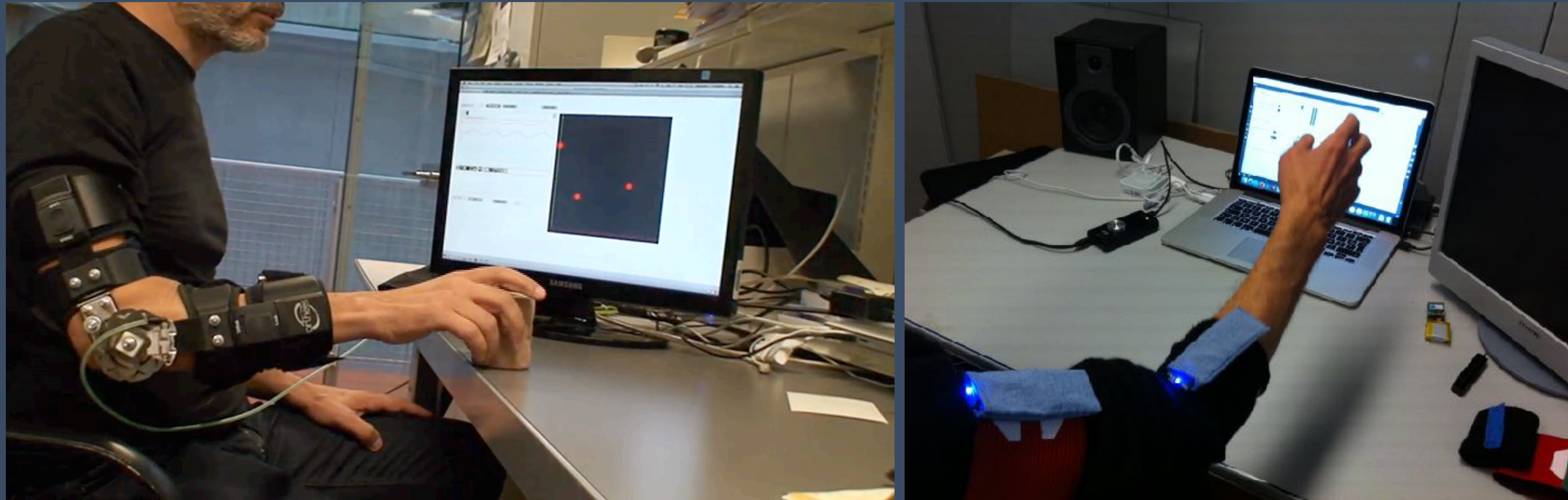
Interacting through “movement qualities”



Fdili Alaoui, S., Bevilacqua, F., Bermudez, B. et Jacquemin, C. (2013).
Dance interaction with physical model visualization based on movement qualities.
International Journal of Arts and Technology,

Rehabilitation with auditory feedback

Sensori-motor learning



Collaboration Ircam & ISIR-UPMC
& Pitié-Salpêtrière(LABEX SMART)

<http://www.smart-labex.fr/ISMES.html>

CoMo

<http://como.ircam.fr>

Gesture and Movement Design

Participatory Design for Movement Learning

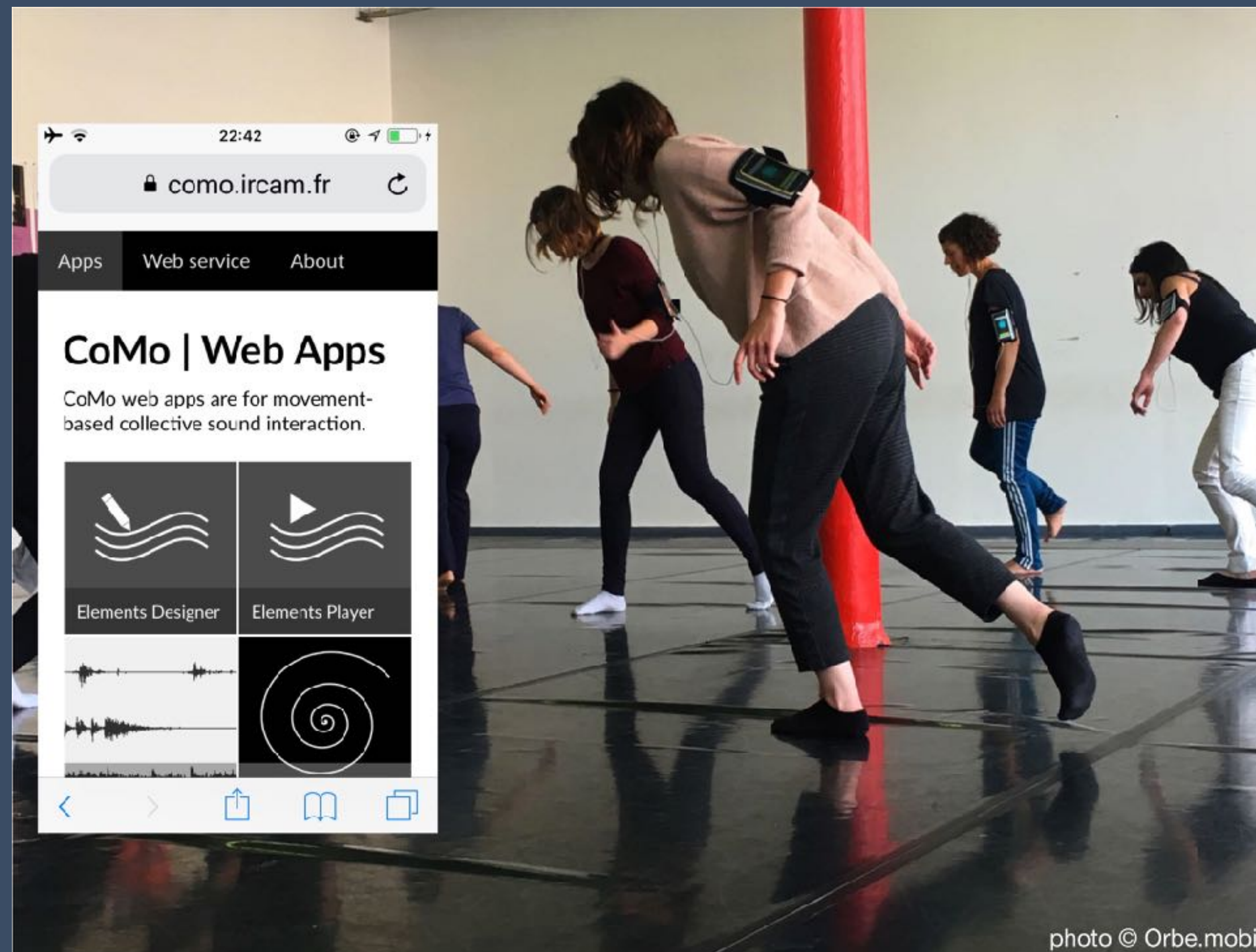


photo © Orbe.mobi

Application à danser - Orbe.mobi

Embodied Navigation of Complex Piano Notation

Pavlos Antoniadis (PhD)

Sensor-based environment for the processing of complex piano notation through physical movement



Co-exploration

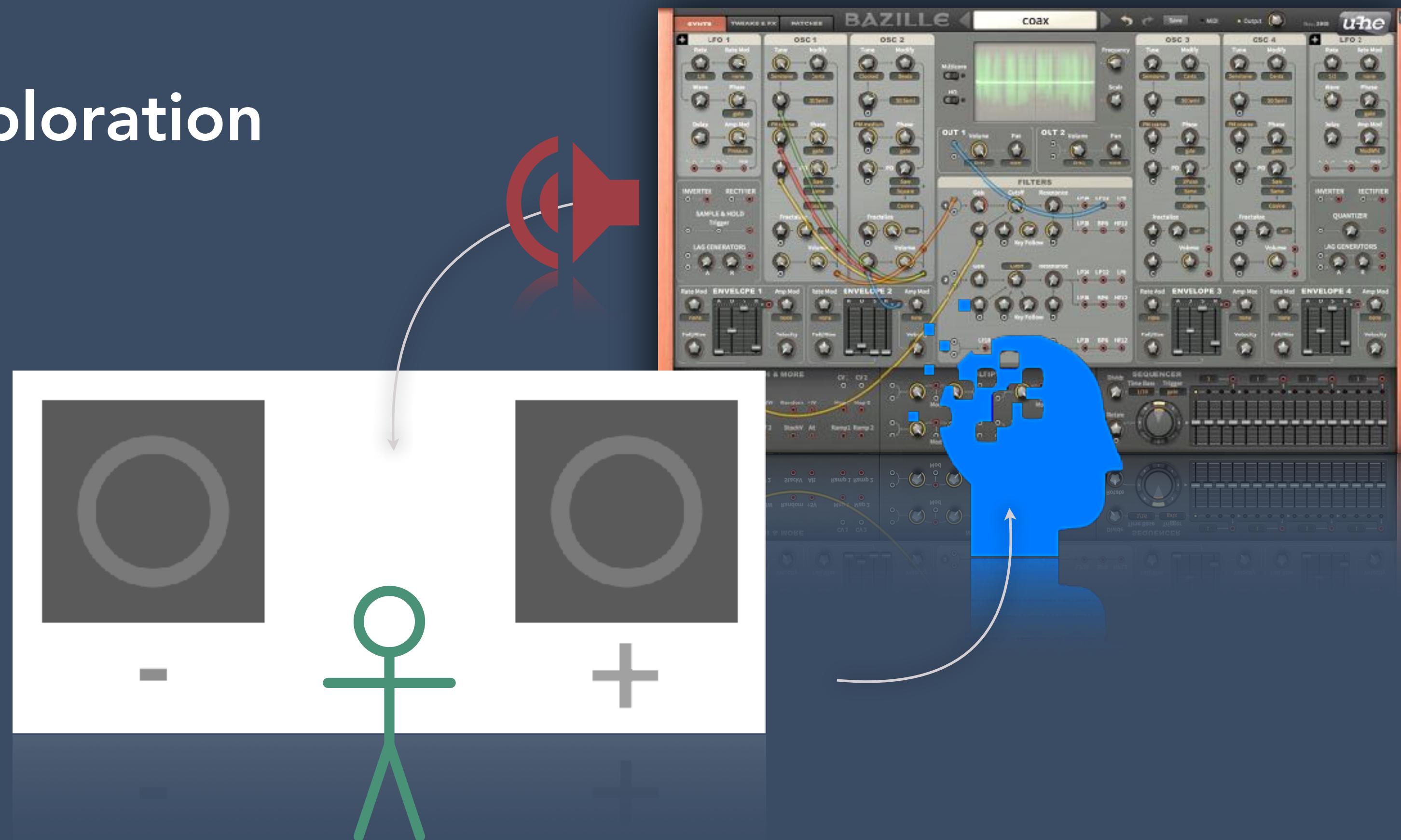
PhD Work Hugo Scurto



Interactive Reinforcement Learning for Human Feedback-Driven Exploration

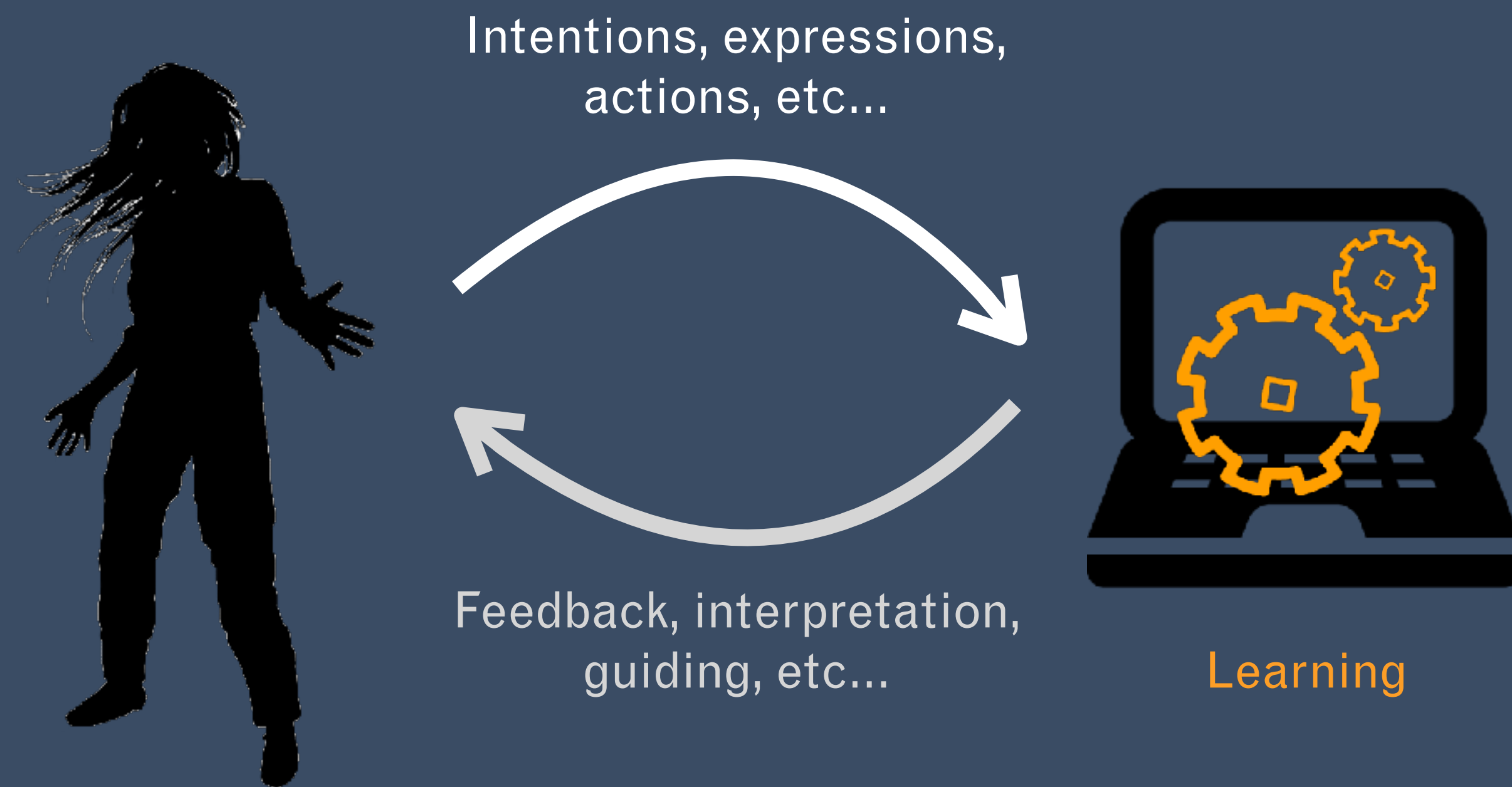
PhD Work Hugo Scurto

VST Co-Exploration



Humans and Interactive Reinforcement Learning Agents
build **collaborative paths** in sonic exploration

Interacting with Learning Systems



Build learning systems to enhance and support skill acquisition and artistic practice.

Study interaction phenomena in this context and their impacts.

LRI (CNRS, University Paris-Sud) & Ex)Situ (Inria)



Movement-based interaction in music performance



Sonic Interaction Design workshops



*Artistic performance
(Cropus Nil by Marco Donnarumma)*

MIM Project

Understanding skill acquisition in music performance.

On of the main results:

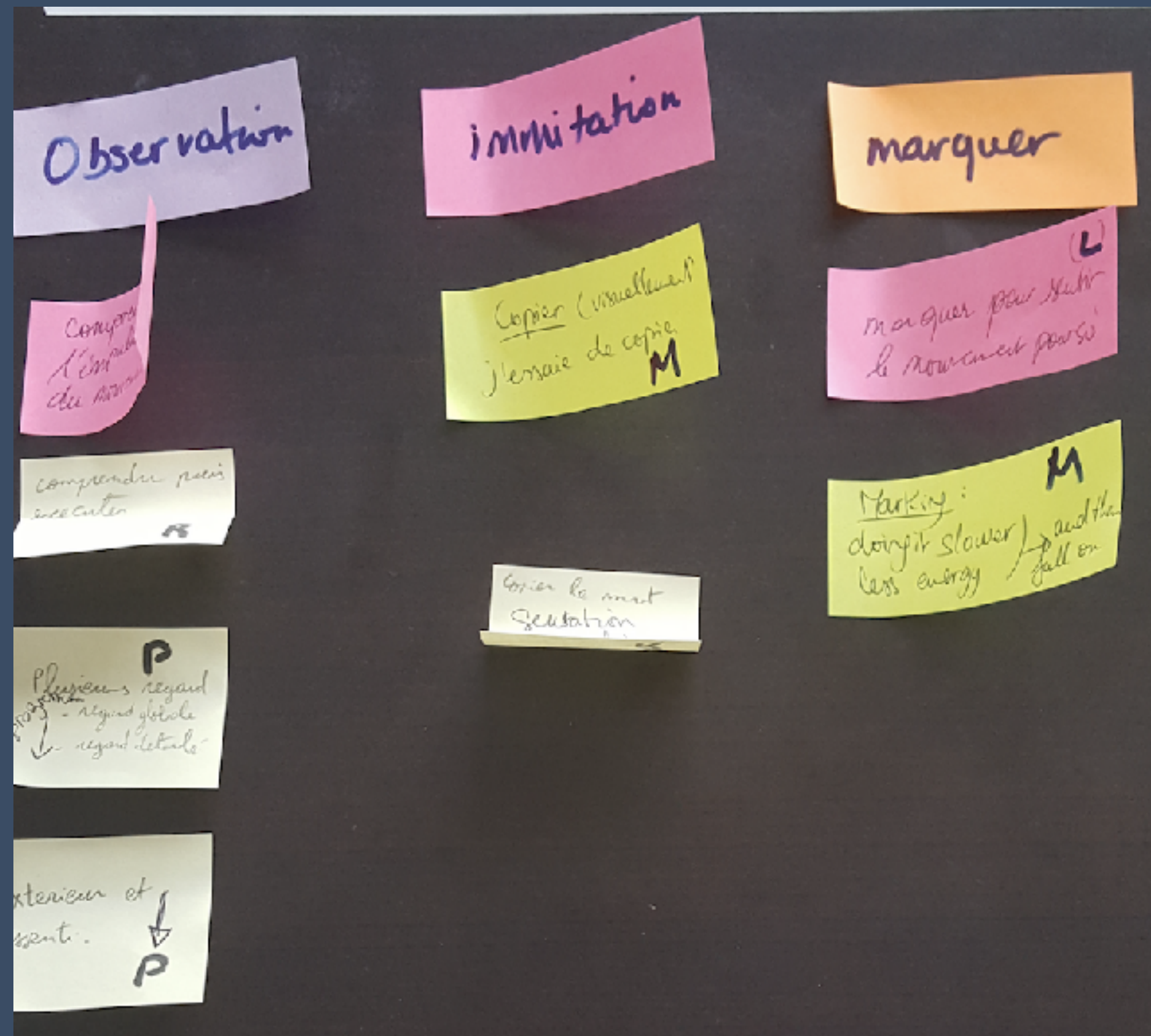
Multifaceted individual-specific structure of motor variability

Details: <http://mim.ircam.fr>



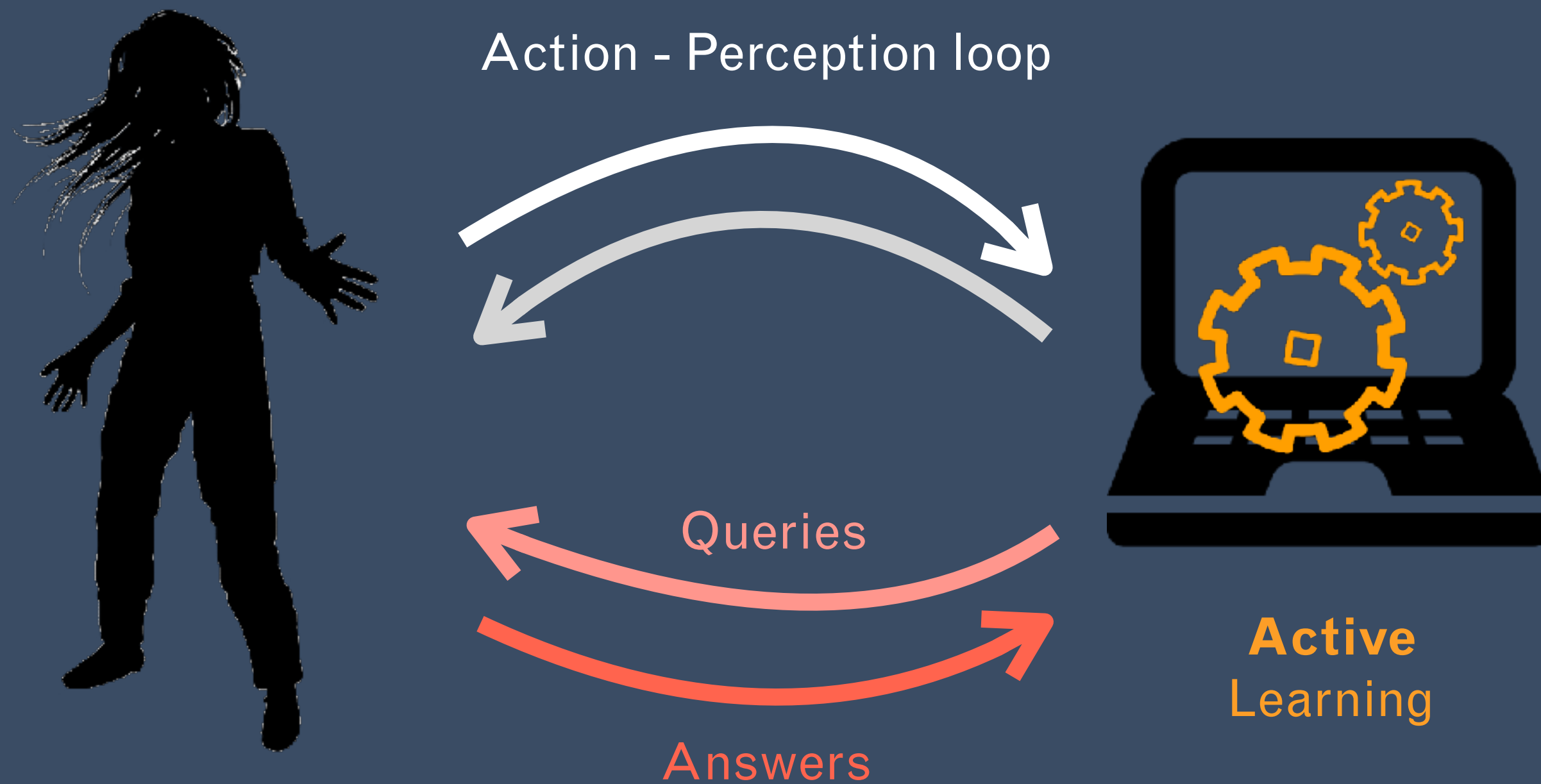
Designing technology for dance movement learning

PhD Work Jean-Philippe Rivière



Co-learning in interactive systems

PhD Work Téo Sanchez



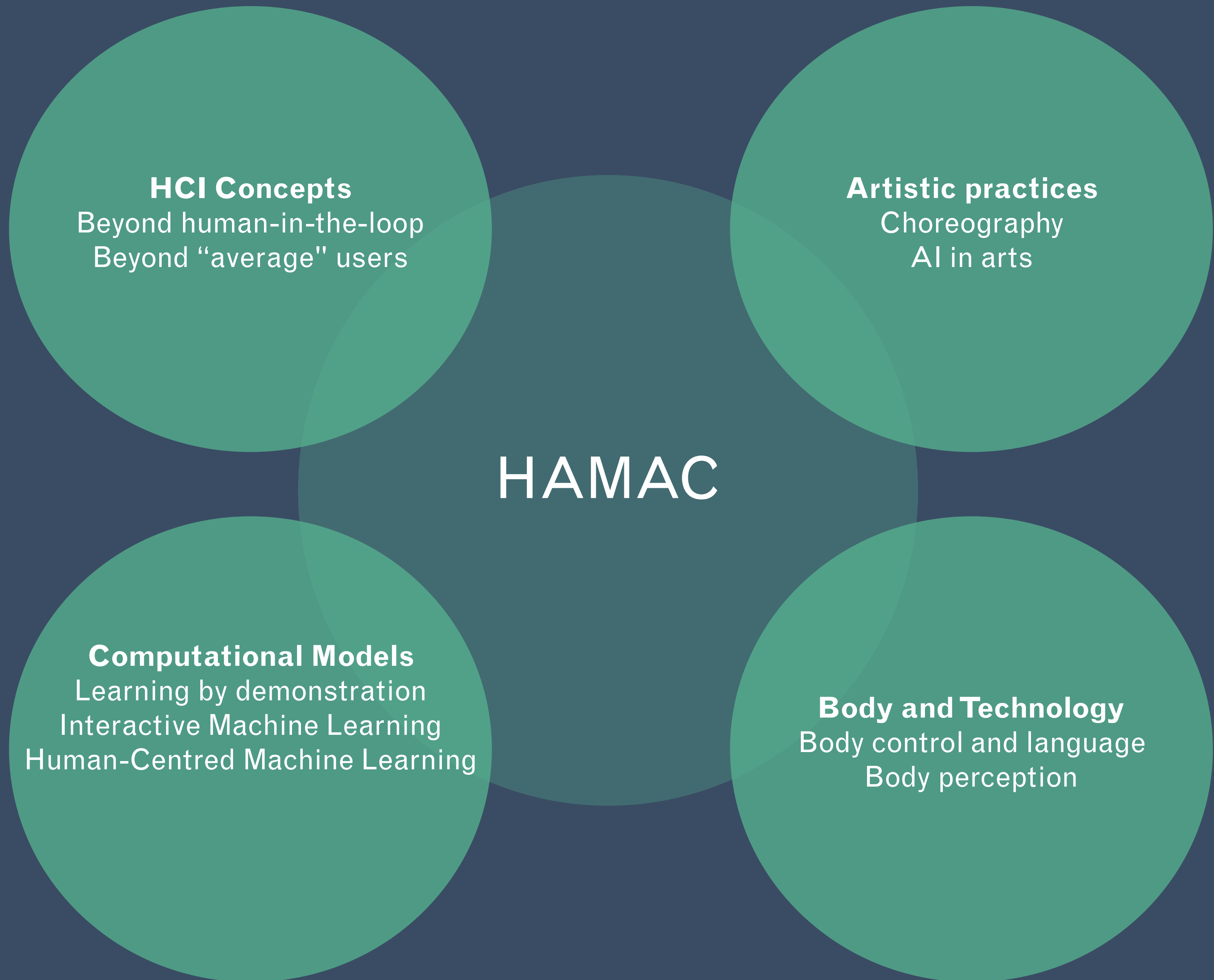
Artist-AI Interaction

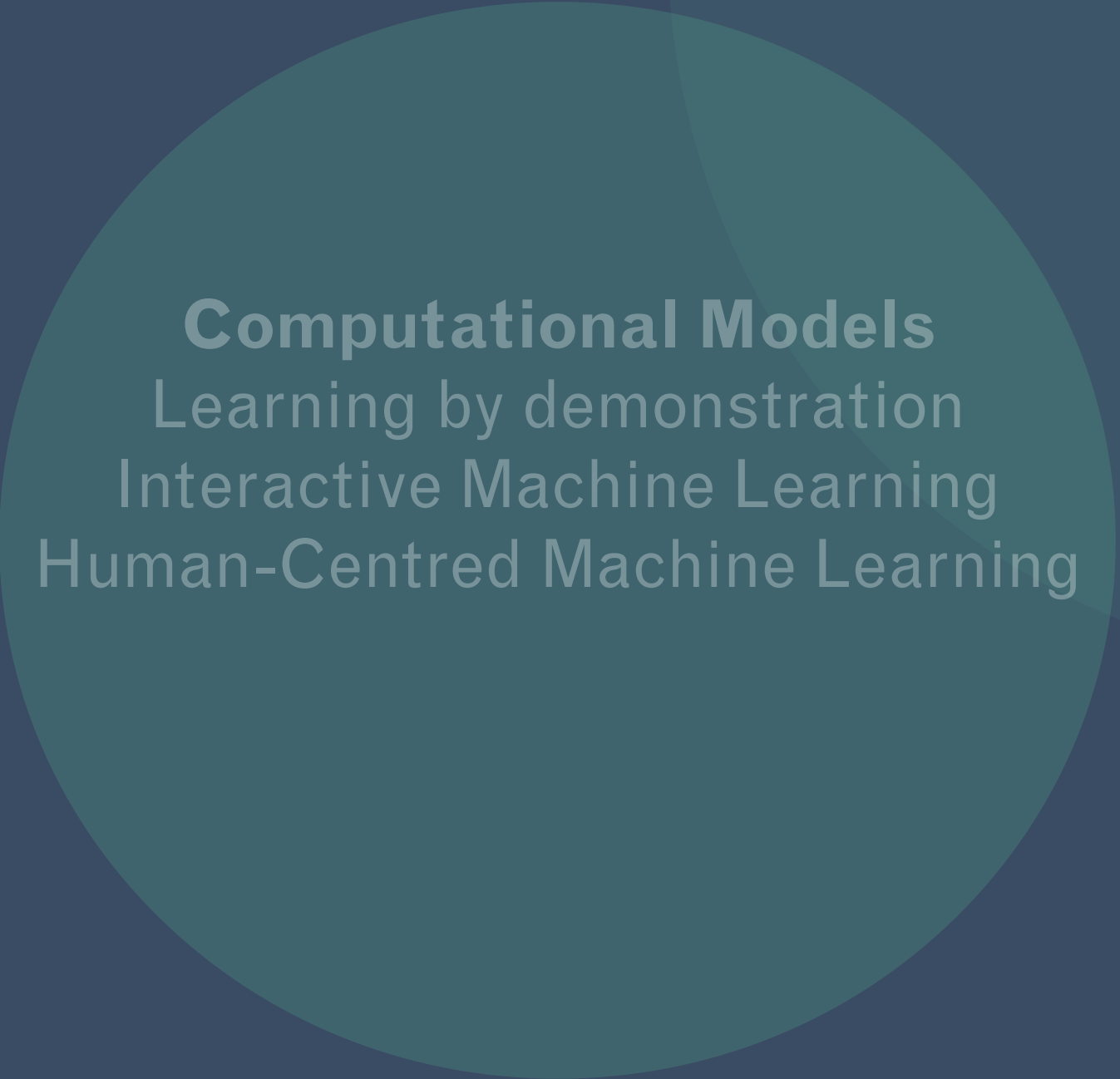
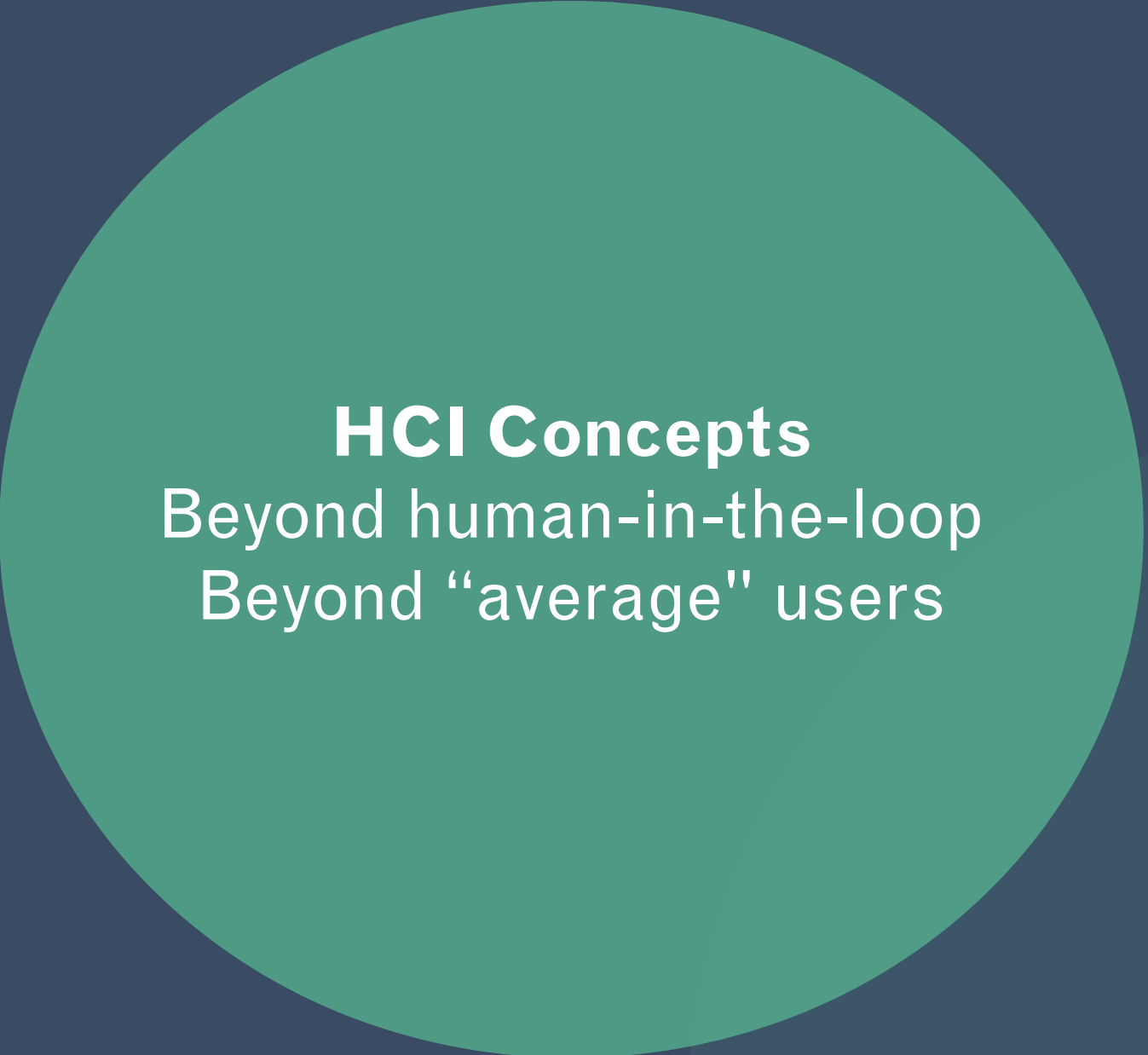
INTACT Project (CNRS PEPS)



“Hello world” album , Flow-Machines

Workshop





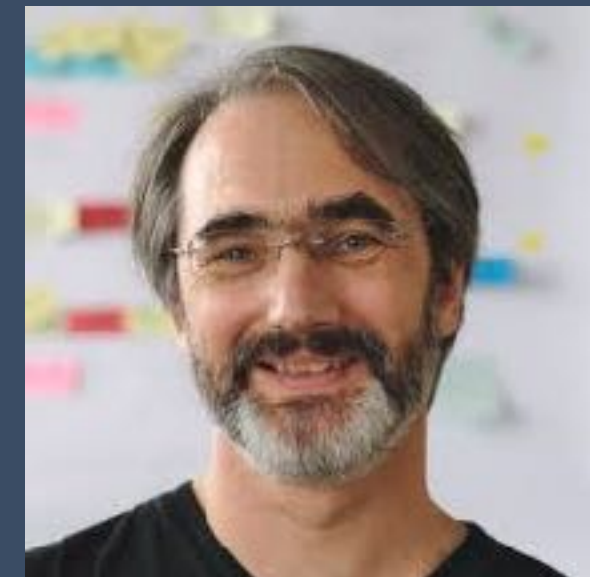
HAMAC

Monday, July 9 - AM

10:30 - 11:00 Creating Human-Computer Partnerships

Wendy Mackay

Michel Beaudouin-Lafon



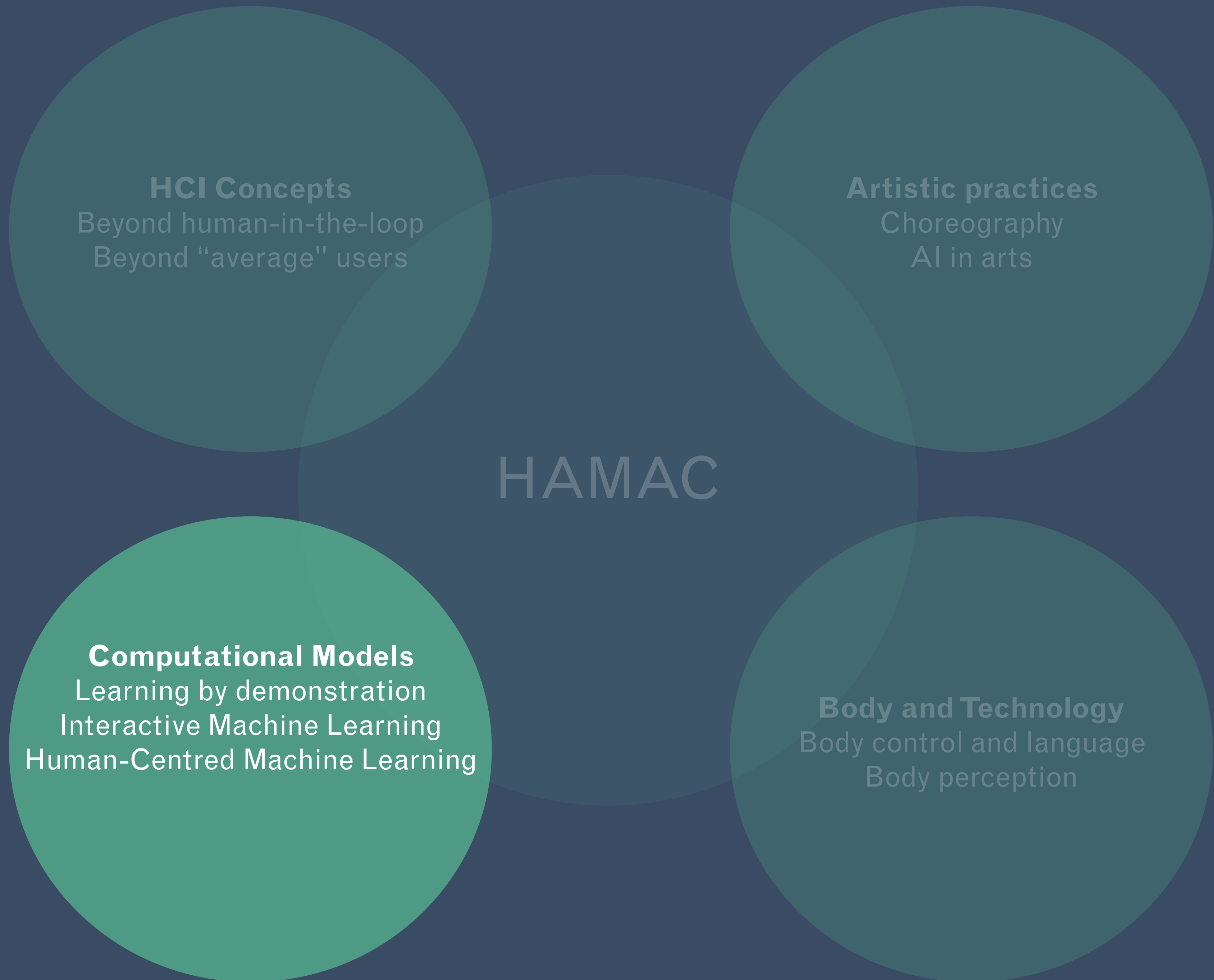
11:00 - 11:30 Designing Personalized User Interfaces as
a Human-Computer Partnership

Joanna McGrenere



11:30 - 11:45 Coffee break

11:45 - 13:00 **Discussions**



Monday, July 9 - PM

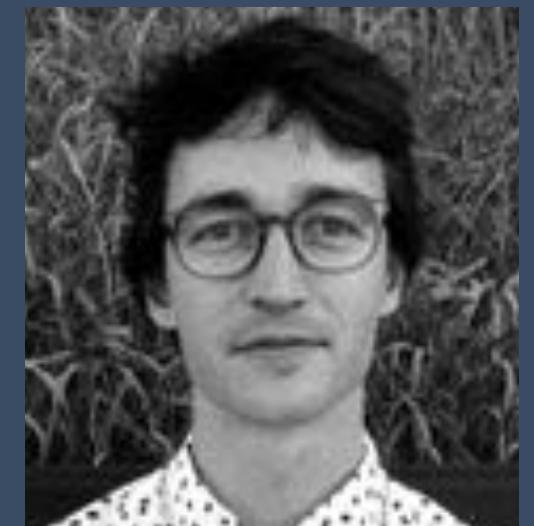
14:30 - 15:00 Robot Learning from few Demonstrations by Exploiting the Structure and Geometry of Data

Sylvain Calinon



15:00 - 15:30 Designing Interactive Auditory Feedback by Demonstration

Jules Françoise



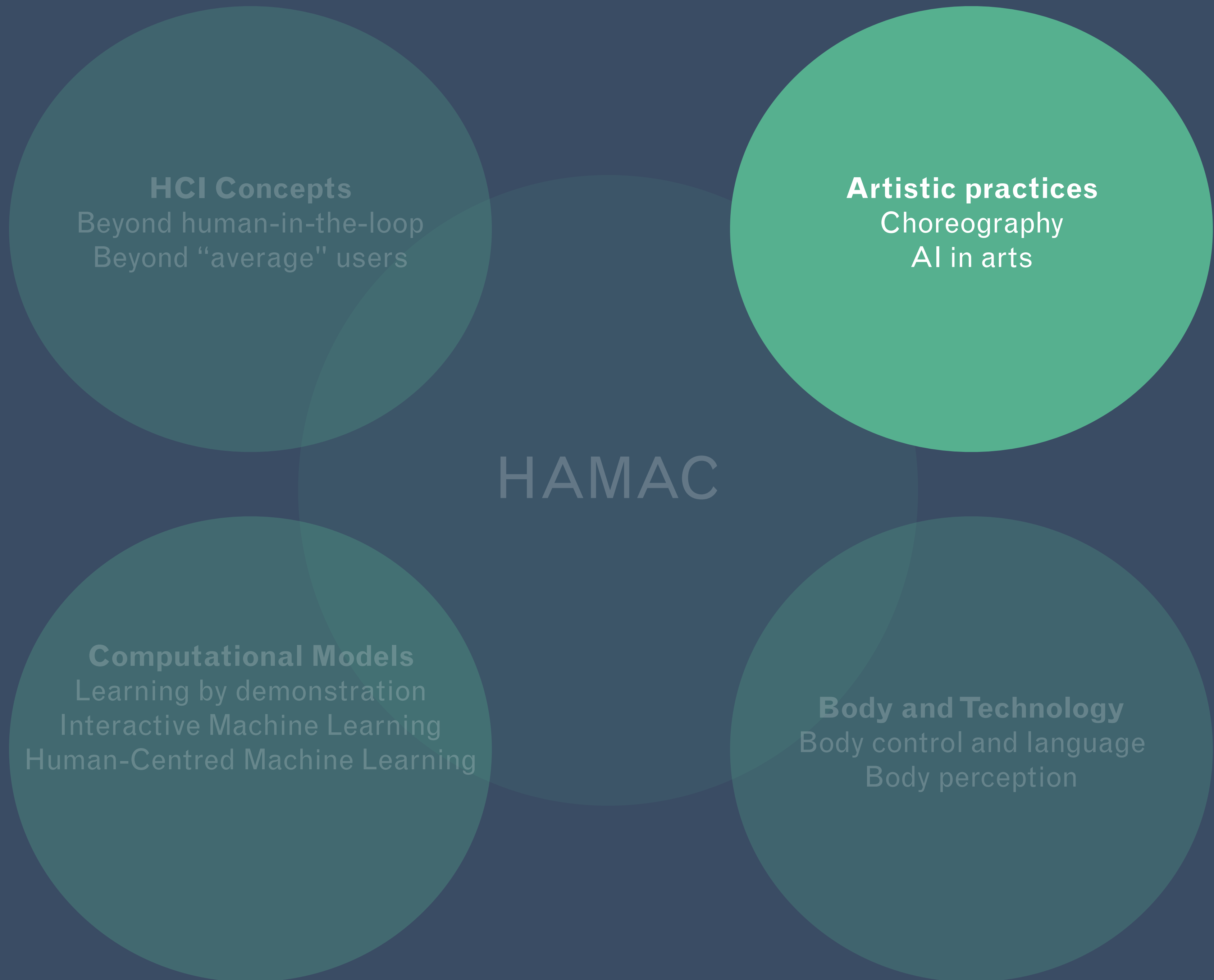
15:30 - 16:00 Interactive Machine Learning for Embodied Interaction

Marco Gillies



16:00 - 16:15 Coffee break

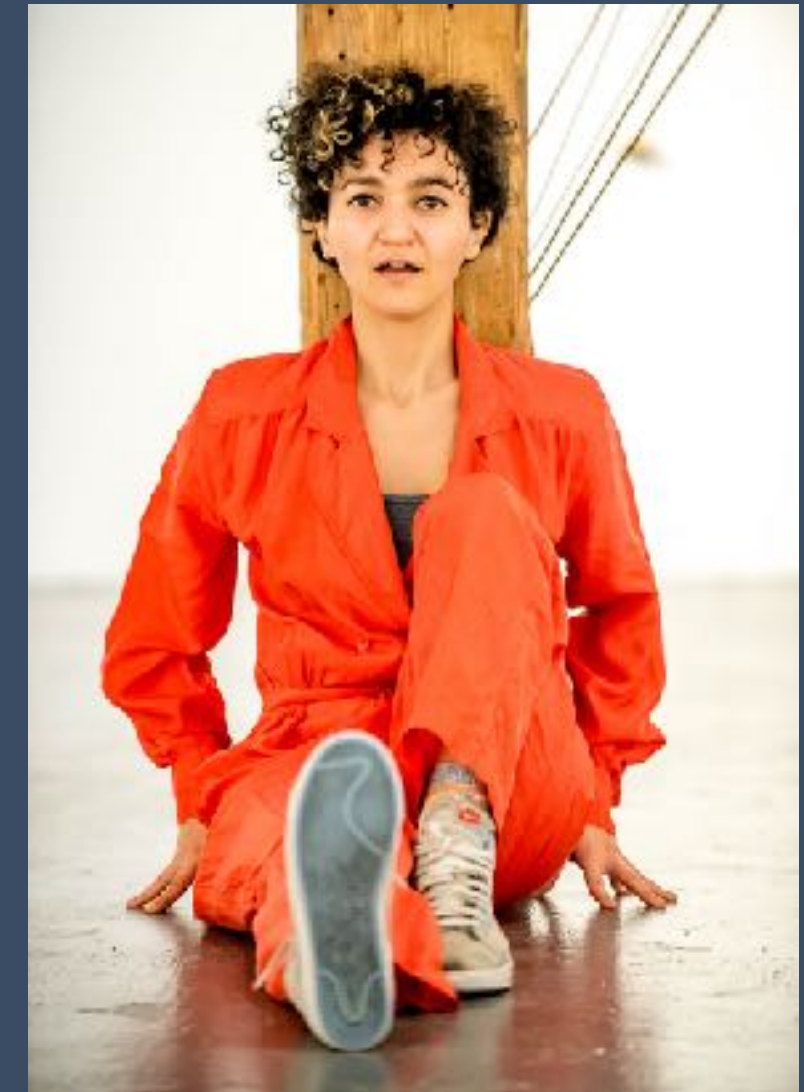
16:15 - 17:30 **Discussions**



Tuesday, July 10 - AM

10:00 - 10:30 Designing for Movement in Dance and
Choreography

Sarah Fdili Alaoui



10:30 - 11:00 Intelligent Machines that Learn: What Do They
Know? Do They Know Things?? Let's Find Out!

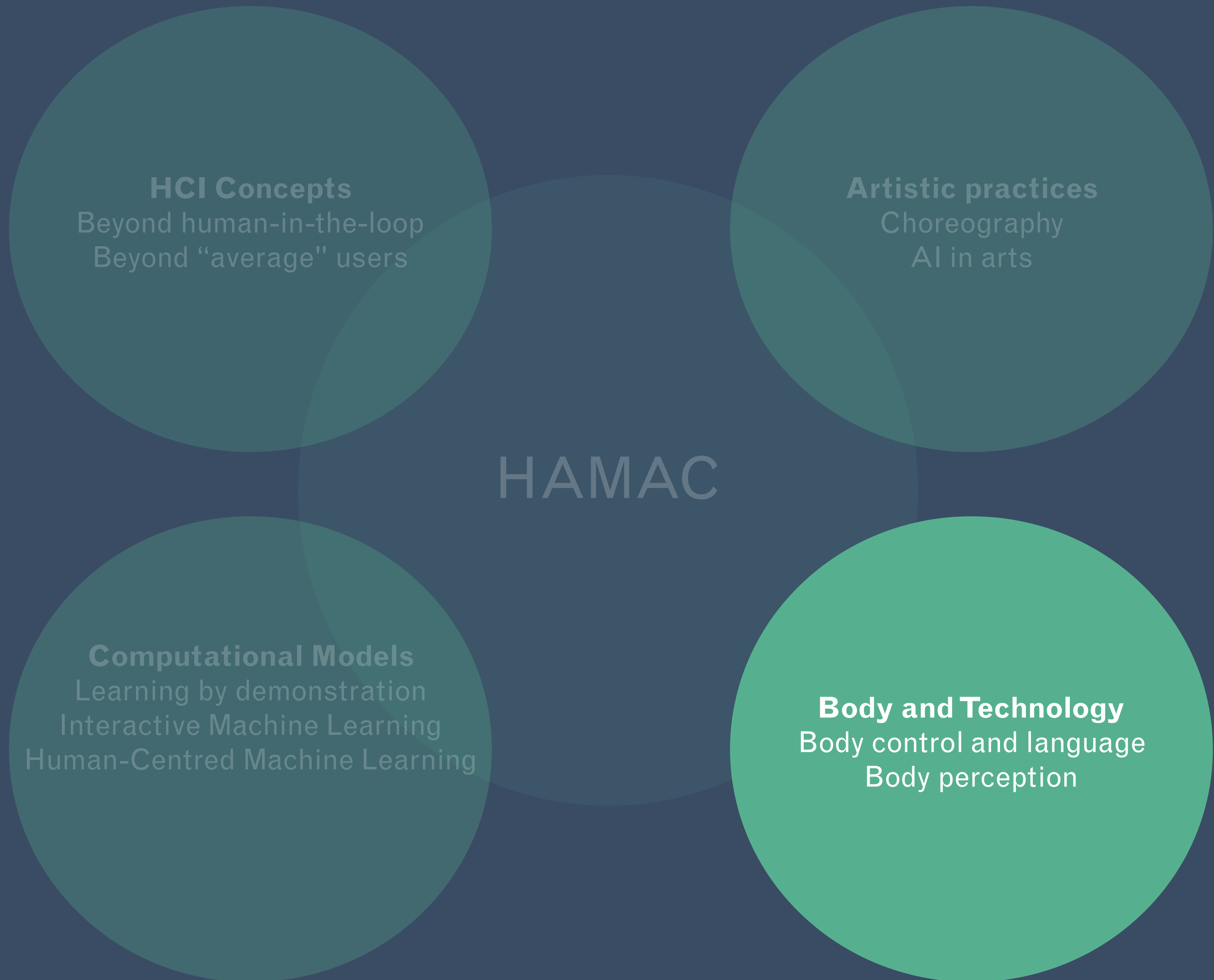
Memo Akten



11:00 - 11:15 Coffee break

11:15 - 12:30 **Discussions**

12:30 - 14:00 Lunch



Tuesday, July 10 - PM

14:00 - 14:30 Movement-Based Control of Upper Limb Prostheses:
Towards the Decoding of Body Language

Nathanaël Jarrassé



14:30 - 15:30 The Affective Multisensorial Body in a
Technology-Mediated World

Nadia Bianchi-Berthouze

Ana Tajadura-Jimenez



15:30 - 15:45 Coffee break

15:45 - 17:00 **Discussions**

