INTERNATIONAL WORKSHOP ON MOVEMENT AND COMPUTING (MOCO’14)
Intersecting Art, Meaning, Cognition, Technology

June 16-17, 2014
IRCAM, Paris, France

http://moco.ircam.fr
MOCO is the first international workshop on movement and computing. It aims to gather academics, artists, and practitioners interested in the embodied and computational exploration, study, modeling, representation, segmentation, recognition, classification, or generation of movement meaning, mapping, semantics and data. MOCO is positioned within emerging interdisciplinary domains between art & science.

The workshop references the challenge of representing embodied movement knowledge within computational models, yet it also celebrates the inherent expression available within movement as a language. While human movement itself focuses on bodily experience, developing computational models for movement requires abstraction and representation of lived embodied cognition. Selecting appropriate models between movement and its rich personal and cultural meanings remains a challenge in movement interaction research.

Many fields, including interaction design, HCI, education and machine learning have been inspired by recent developments within neuroscience validating the primacy of movement in cognitive development and human intelligence. This has spawned a growing interest in experiential principles of movement awareness and mindfulness, while simultaneously fueling the need for developing computational models that can describe movement intelligence with greater rigor. This conference seeks to explore an equal and richly nuanced epistemological partnership between movement experience and movement cognition and computational representation.

MOCO papers will be published in the International Conference Proceedings Series published by ACM and available in the ACM Digital Library.
# Overview

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<td>Session 4: Computational Systems for Movement Analysis</td>
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<td>Session 2: Movement Representation, Visualisation &amp; Animation</td>
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<td>Session 5: Movement and Music</td>
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<td>15:40</td>
<td>Session 3: Movement in Interactive Art</td>
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<td>Demos &amp; Posters</td>
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<td>Closing Discussion</td>
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<td>Banquet (registered people)</td>
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Monday, June 16, 2014

8:30 - 9:15: IRCAM lobby
   ➔ Registration

9:15 - 9:30: Stravinsky Room (level 0)
   ➔ Welcome

9:30 - 10:30: Stravinsky Room (level 0)
   ➔ Keynote: David Kirsh – “A Cognitive Scientist Looks at Dance Making”

10:30 - 11:00: (level -2)
   ➔ Coffee Break

11:00 - 12:40: Stravinsky Room (level 0)
   ➔ Session 1: Choreography and Computing

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<th>TIME</th>
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<tr>
<td>11:00</td>
<td>Sarah Fdili Alaoui, Kristin Carlson &amp; Thecla Schiphorst</td>
<td>Choreography as Mediated through Compositional Tools for Movement: Constructing A Historical Perspective</td>
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<tr>
<td>11:20</td>
<td>Bertha Bermudez &amp; Chris Ziegler</td>
<td>Pre-Choreographic Movement Kit</td>
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<tr>
<td>11:40</td>
<td>Shannon Cuykendall, Thecla Schiphorst &amp; Jim Bizzocchi</td>
<td>Designing Interaction Categories for Kinesthetic Empathy: A Case Study of Synchronous Objects</td>
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<tr>
<td>12:00</td>
<td>Kirk Woolford</td>
<td>Capturing Movement in the Wild</td>
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<td>12:20</td>
<td>Katerina El Raheb &amp; Yannis Ioannidis</td>
<td>From Dance Notation to Conceptual Models: A Multilayer Approach</td>
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</table>

12:40 - 14:00: (level -2)
   ➔ Lunch
Monday, June 16, 2014

14:00 - 15:20: Stravinsky Room (level 0)

→ **Session 2: Movement Representation, Visualisation & Animation**

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</table>
| 14:00  | Frederic Fol Leymarie, Prashant Aparajeya 
& Carol MacGillivray | Point-based Medialness for Movement Computing        |
| 14:20  | Omid Alemi, Philippe Pasquier & Chris Shaw | Mova: Interactive Movement Analytics Platform        |
| 14:40  | Aaron Levisohn & Thecla Schiphorst | Tagging with Movement: Somatic Strategies for Image Classification |
| 15:00  | Nesrine Fourati & Catherine Pelachaud | Collection and Characterization of Emotional Body Behaviors |

15:20 - 15:40: (level -2)

→ **Coffee Break**

15:40 - 16:40: Stravinsky Room (level 0)

→ **Session 3: Movement in Interactive Art**

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<tr>
<td>15:40</td>
<td>Grisha Coleman &amp; Daragh Byrne</td>
<td>36 Walk: A Case Study of Reciprocity in Movement and Computation</td>
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<tr>
<td>16:00</td>
<td>Simon Biggs, Sue Hawksley &amp; Garth Paine</td>
<td>Crosstalk: Making People in Interactive Spaces</td>
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<td>16:20</td>
<td>Gregory Beller</td>
<td>The Synekine Project</td>
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16:40 - 18:40:
→ **Posters**: (level -2)

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<tr>
<td>Lamtharn Hantrakul &amp; Konrad Kaczmarek</td>
<td>Implementations of the Leap Motion Device in Sound Synthesis and Interactive Live Performance</td>
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<td>Mary Mainsbridge</td>
<td>Non-tactile Gestural Control in Musical Performance</td>
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<td>Andrew Bluff &amp; Andrew Johnston</td>
<td>Creative Control of Granular Synthesis Using Fluid Simulation &amp; Motion Tracking</td>
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<td>Donald Glowinski, Tamara Ott, Kanika Shirole, Naëm Baron, Kim Torres-Eliard, Marc-André Rappaz &amp; Didier Grandjean</td>
<td>Analyzing Expressive Styles and Functions of Bodily Movement in Violinist Performance</td>
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<td>Rebecca Warzer, Elizabeth B. Torres &amp; Asaf Bachrach</td>
<td>Micro-Movement as Physical Signature of Movement Intention in Work of Choreographer Myriam Gourfink</td>
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<tr>
<td>Yohan Zeitoun</td>
<td>Perceptual Evaluation of Qualitative Information Conservation Within Point-Light Display</td>
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<td>Alexander Berman &amp; Valencia James</td>
<td>Towards a Live Dance Improvisation between an Avatar and a Human Dancer</td>
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<tr>
<td>Nicolas Bremard, Laurent Grisoni &amp; Bruno De Araujo</td>
<td>Interaction Events in Contactless Gestural Systems: from Motion to Interaction</td>
</tr>
<tr>
<td>Marco Donnarumma</td>
<td>Notes on Bimodal Muscle Sensing for the Sonification of Indeterminate Motion</td>
</tr>
<tr>
<td>Christina Volioti, Sotiris Manitsaris &amp; Athanasios Manitsaris</td>
<td>Offline Statistical Analysis of Gestural Skills in Pottery Interaction</td>
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16:40 - 18:40:
→ **Demos**: studio 5 (level -2). Each demo has a corresponding paper or poster.

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<tr>
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<tr>
<td>Bertha Bermudez &amp; Chris Ziegler</td>
<td>Pre-Choreographic Movement Kit</td>
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<td>Garth Paine, Simon Biggs &amp; Sue Hawksley</td>
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<tr>
<td>Jan C. Schacher &amp; Daniel Bisig</td>
<td>Expressive Movement in Electronic Music Performance</td>
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<tr>
<td>Marco Donnarumma</td>
<td>Xth Sense</td>
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8:30 – 9:30: Studio 5 (level -2)
→ Movement Warm-up

9:30 – 10:30: Stravinsky Room (level 0)
→ Keynote: Céline Latulipe – “Movement Work at a Distance: Affordances and Challenges”

10:30 – 11:00: (level -2)
→ Coffee Break

11:00 – 12:40: Stravinsky Room (level 0)
→ Session 4: Computational Systems for Movement Analysis

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<tr>
<td>11:00</td>
<td>John McCormick, Kim Vincs, Saeid Nahavandi, Douglas Creighton &amp; Steph Hutchison</td>
<td>Teaching a Digital Performing Agent: Artificial Neural Network and Hidden Markov Model for Recognising and Performing Dance Movement</td>
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<td>11:20</td>
<td>Baptiste Caramiaux</td>
<td>Motion Modeling for Expressive Interaction – A Design Proposal using Bayesian Adaptive Systems</td>
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<tr>
<td>11:40</td>
<td>Thierry Ravet, Joëlle Tilmanne &amp; Nicolas D’Alessandro</td>
<td>Hidden Markov Model Based Real-Time Motion Recognition and Following</td>
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<tr>
<td>12:00</td>
<td>Vanessa Yaremchuk &amp; Marcelo M. Wanderley</td>
<td>Brahms, Bodies and Backpropagation</td>
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<td>12:20</td>
<td>Sam Ferguson, Emery Schubert &amp; Catherine Stevens</td>
<td>Dynamic Dance Warping: Using Dynamic Time Warping to Compare Dance Movement Performed under Different Conditions</td>
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12:40 – 14:00: (level -2)
→ Lunch
Tuesday, June 17, 2014

14:00 - 15:20: Stravinsky Room (level 0)  
≥ Session 5: Movement and Music  

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<tr>
<td>14:00</td>
<td>Federico Visi, Rodrigo Schramm &amp; Eduardo Miranda</td>
<td>Gesture in Performance with Traditional Musical Instruments and Electronics - Use of Embodied Music Cognition and Multimodal Motion Capture to Design Gestural Mapping Strategies</td>
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<td>14:20</td>
<td>Jan C. Schacher &amp; Daniel Bisig</td>
<td>Watch This! Expressive Movement in Electronic Music Performance</td>
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<td>14:40</td>
<td>Benjamin Bacon, Marcelo Wanderley &amp; Fabrice Marandola</td>
<td>Handedness in Percussion Sight-Reading</td>
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<td>15:00</td>
<td>Alvaro Sarasua &amp; Enric Guaus</td>
<td>Beat Tracking from Conducting Gestural Data: a Multi-Subject Study</td>
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15:20 - 15:40: (level -2)  
≥ Coffee Break

15:40 - 16:40: Stravinsky Room (level 0)  
≥ Session 6: Perspectives on Movement  

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<td>Harry Brenton, Andrea Kleinsmith &amp; Marco Gillies</td>
<td>Embodied Design of Dance Visualisations</td>
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<td>Stina Nylander &amp; Jakob Tholander</td>
<td>Designing for Movement - the Case of Sports</td>
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<td>16:20</td>
<td>Sally-Jane Norman</td>
<td>Grappling with Movement Models: Performing Arts and Slippery Contexts</td>
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16:40 - 17:00: Stravinsky Room (level 0)  
≥ Closing Discussion
Keynotes

David Kirsh
Professor, University of California San Diego

A Cognitive Scientist Looks at Dance Making

David Kirsh is Professor and past chair of the Department of Cognitive Science at UCSD. He was educated at Oxford University (D.Phil), did post doctoral research at MIT in the Artificial Intelligence Lab, and has held research or visiting professor positions at MIT and Stanford University. He has written extensively on situated and distributed cognition and especially on how the environment can be shaped to simplify and extend cognition, including how we intelligently use space, and how we use external representations to amplify and speed up thought. He runs the Interactive Cognition Lab at UCSD where the focus is human-world coupling, and designing environments to make us smarter. A recent project focuses on how humans think with their body, specifically in dance making and choreographic cognition, and on distributed creativity in movement design. This study is based on his six-year collaboration with Wayne McGregor and Random Dance. He is co-Director of the Arthur C. Clarke Center for Human Imagination, and he is on the board of directors for the Academy of Neuroscience for Architecture.
Celine Latulipe  
Associate Professor, University of North Carolina at Charlotte

**Movement Work at a Distance: Affordances and Challenges**

Dr. Celine Latulipe has a PhD in Computer Science from the University of Waterloo in Canada. She is an Associate Professor of Human-Computer Interaction in the Department of Software and Information Systems in the College of Computing and Informatics at UNC Charlotte. Dr. Latulipe has long been fascinated by two-handed interaction in the real world, and the absence of it in the human-computer interface. She has developed numerous individual and collaborative multi-cursor interaction techniques and these have blossomed into an exploration of creative expression. Dr. Latulipe works on projects with choreographers, dancers, artists and theatre producers to better understand creative work in practice and how technology may play a role in supporting and evaluating creative work practices. Dr. Latulipe spent four years leading the Dance Draw project, funded by an NSF Creativity grant.
Workshop Chairs
Frédéric Bevilacqua, IRCAM, Paris, France
Sarah Fdili Alaoui, SIAT, SFU, Vancouver, Canada
Jules Françoise, IRCAM, Paris, France
Thecla Schiphorst, SIAT, SFU, Vancouver, Canada
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Alexander Refsum Jensenius, University of Oslo, Norway
IRCAM, the Institute for Research and Coordination in Acoustics/Music, is one of the world’s largest public research centers dedicated to both musical expression and scientific research. A unique location where artistic sensibilities collide with scientific and technological innovation, Frank Madlener has directed the institute since 2006, bringing together over 160 people.

IRCAM’s three principal activities – creation, research, transmission – are visible in IRCAM’s Parisian concert season, in productions throughout France and abroad, in a new rendezvous created in June 2012, ManiFeste, that combines an international festival with a multidisciplinary academy.

Founded by Pierre Boulez, IRCAM is associated with the Centre Pompidou, under the tutelage of the French Ministry of Culture and Communication. The mixed STMS research lab (Sciences and Technologies for Music and Sound), housed by IRCAM, also benefits from the support of the CNRS and the University Pierre and Marie Curie, as well as Inria (team-project MuTant).

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Andy Armstrong, Technical Assistant
Acknowledgements

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Ministère de la Culture et de la Communication
Université Pierre et Marie Curie
Agence nationale de la recherche
CNRS

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Kunststiftung NRW
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Sylvie Benoit, Frédéric Bevilacqua, Nicolas Donin, Frederick Rousseau, Norbert Schnell

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