

Visual user interfaces for human motion

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ABSTRACT

Visual interfaces are important in human motion to capture it, to visualize it, and to facilitate motion-based interactive systems. This workshop aims at providing a platform for researchers, designers and users to discuss the challenges related to the design of visual interfaces for motion-based interaction, in terms of visualization (e.g. graphical user interface, multimodal feedback, evaluation) and processing (e.g., data collection, treatment, interpretation, recognition) of human movement (e.g., motor skills, amplitude of movements, limitations). We will share experiences, lessons learned and elaborate tools for developing all the possible applications going forward.

CCS CONCEPTS

• Human-centered computing → Gestural input.

KEYWORDS

Motion-based interaction, gesture recognition, wearable devices, movement computing, motion capture.

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1 INTRODUCTION

Human movement as input can be explored across several dimensions, spatial, temporal, using multiple scales, metaphors and variations. Sensing human movement is very attractive for designing interaction with technologies because it enables not only direct contact with displays, but also with and around the devices, or even in the physical spaces [1], [3]. When considering the users perspective, visual interfaces are fundamental to provide feedback on the data being captured and the resulting interaction, and should be carefully considered during design and evaluation [7], [6], [2], [5].

After a first workshop examining the HCI Challenges in human movement analysis [4], focusing on the similarities across a great extent of applications, this second event aims at providing a platform for designers, practitioners, researchers and users to identify, understand, and discuss the challenges posed by the design of these multi-faceted interfaces based on human movement.

2 MOTIVATION AND OBJECTIVES

Significant advances have been made for Human Movement (HM) acquisition (e.g., through sensors, body devices), processing (e.g., data collection, treatment, recognition), and interpretation (e.g., motor skills, amplitude of movements). In the series of design challenges for user interfaces based on human movement, how to best provide visualization of motion-based interaction and improve end user engagement? This one-day workshop aims at defining and discussing methods and experiences of designing visual interfaces for motion-based interaction.

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2.1 Topics list

We strongly encourage contributions from different domains and areas of application, including for example, but not limited to: *Motion-based Interaction, Full-body interaction, (Multi)Sensory Interfaces, Movement computing and motion capture, Embodied interaction, Natural user interfaces, Gesture interaction/recognition, Wearable devices, Biofeedback.*

2.2 Target audiences

Designers, practitioners, researchers and users of systems based on human-movement as input for interaction.

2.3 Call for papers and website

The call for papers and further information about the workshop will be available in the website: hcihumanmovement.org Prior to starting the workshop, a list of accepted authors and an analysis of the areas of application they represent, with their respective challenges, will be added to the website in order to highlight the value of the contributions and present the extent of the workshop discussion. A book proposal is being developed, and authors of accepted position papers will be invited to contribute.

2.4 Workshop program

Remote participation will be facilitated as much as possible. The workshop will be composed by two interactive sessions. The first part (morning) will focus on the challenges and difficulties of designing visual interfaces for motion-based interactions. Authors of accepted position papers will be invited to do brief presentation, followed by questions and answers. In the second part (afternoon), an interactive activity (on site) will engage all the participants for the elaboration of a diagram describing the overall process of human movement analysis, focusing on the requirements for meeting the final users' needs and expectations. We will then try to classify the requirements and define the priorities to be tackled (i.e. affinity diagrams). The workshop discussion will focus on the possibilities and practices to address the emerging challenges. Organizers will lead the discussion to allow all participants to share their experiences and lessons learned. From the analysis of the position papers, organisers will prepare and present some reference material to support participants in their current and future projects. This material might include prototyping, design methods, usability evaluation tools, techniques for bio-mechanical and ergonomic evaluations.

3 AUTHOR'S BIOS

The organizers contribute to the discussion from a diverse panel of areas of application, domains and experience.

Lilian Genaro Motti Ader (primary contact) is a postdoctoral researcher at School of Public Health, Physiotherapy and Sports Sciences at University College Dublin, Ireland. Her research goal is to improve the usability and data capture of health technologies, in particular for gait analysis.

Benoit Bossavit is a postdoctoral researcher at the School of Statistics and Computer Science at Trinity College Dublin, Ireland. His research interest focuses on the design, development and evaluation of a framework aiming at screening gross-motor skills in young children.

Brian Caulfield is a full professor of Physiotherapy at University College Dublin, Ireland. His research focus on the application of digital supports and data driven technologies for evaluating human behavior and performances in health and sport.

Pourang Irani is a professor at the University of Manitoba, Canada. His research interests include information visualization, input devices, navigation interfaces, mobile and ubiquitous user interfaces. Katerina El Raheb is a researcher at the University of Athens and Athena Research Center, Greece. She is mainly interested in Dance Interactive Learning Systems, Movement semantics and knowledge representation, as well as movement in artistic, creative and cultural contexts.

Mathieu Raynal is an assistant professor in Human Computer Interaction at the University of Toulouse, France. He works on design and evaluation of new text input systems and pointing devices for interaction contexts in which text input and pointing are difficult (disability, mobility).

Karine Lan Hing Ting is a researcher at ActivAgeing Living Lab, Troyes University of Technology, France. She is currently applying human movement analysis to inform the design of multimodal Ambient Assisted Living (AAL) technologies.

Jean Vanderdonckt is a full professor in Information Systems at Louvain School of Management, Université catholique de Louvain, Belgium. His research interests are gesture recognition, gesture interaction, intelligent user interfaces, and engineering interactive computing systems (EICS).

Nadine Vigouroux is a researcher at the University of Toulouse, France. She works on the development and evaluation of HCI for users with different motor and cognitive skills.

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