A Manifesto for the Performative Development of Ubiquitous Media

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ABSTRACT
This paper addresses design agendas in Human-Computer Interaction and neighbouring fields motivated by the *mixing* of areas that were mostly kept separate until recently, such as media studies, performing arts, computing, and ubiquitous or tangible interfaces. Referring to new developments in this interdisciplinary research area, and moving from three specific design cases, this paper proposes a critical design agenda that pragmatically joins: concepts from media studies, tangible or ubiquitous media design concerns, anthropological perspectives to performance and practices of theatre performance.

ON DESIGN AGENDAS AND UBIQUITOUS MEDIA
A discussion on design agendas in Human-Computer Interaction and neighbouring fields is made particularly timely by the *mixing* of areas that were mostly kept separate until recently, for example, media production, computing, and ubiquitous or tangible interfaces. We refer to this mixed area with the concept of ubiquitous media, for which we propose a critical design agenda. For HCI in general, different design agendas and approaches can set different priorities privileging a certain aspect of the design, for example, the social, the cognitive, usability, or efficiency; they can point to a vision as pervasive computing or ambient environments, addressing predominantly some settings or scenarios; they can make use of different design methodologies and conceptual frameworks.

Several new design agendas and approaches have surfaced recently. Dourish [11], drawing from ethnomethodology and phenomenology, proposes a new model of human-computer interaction based on the notion of embodied interaction that he defines as "the creation, manipulation, and sharing of meaning through engaged interaction with artefacts" (p. 126). While providing a set of principles around embodied interaction, Dourish recognizes that questions of "how it should be developed, explored, and instantiated remain open research problems". Other approaches have critiqued the 'disappearance' of computers in the environment and the strive for embodied interaction, suggesting that these design ideals may be unachievable or incomplete and proposing seamful design and design in heterogeneity as alternative or complementary agendas [10]. A design philosophy and agenda for everyday computational things has been proposed [17], where meaningful presence is contrasted to previous imperatives from usability as, for example, efficient use. In this design approach, time is the central parameter as exemplified by "Slow Technology" and aesthetics is the basis to design presence. Designing for the user experience and its social dimension co-experience [13] are also related attempts to define design agendas for HCI and related fields. Lately, designing pleasurable products and design for emotions are growing areas of research into designing interactive systems [6,22].

Unlike the above approaches, our contribution joins pragmatically the following elements into a critical design agenda: 1) concepts from media studies, 2) tangible or ubiquitous computing programs, 3) anthropological perspectives to performance and practices of theatre performance.

Based on experiences from three design projects we outline a programmatic manifesto that contains the following themes:

- applying concepts from media studies as generative principles to realise potentials of ubiquitous media
- investigating novel practices and forms of participation in multimedia production and use

AARHUS'05 8/21-8/25/05 Århus, Denmark

- applying concepts from anthropology of performance to situate interaction within events, expression and experiencing
- approaches to devising collective action from the practice in the performing arts that translate into interaction design to 'make sense' of the role of space, artefacts, constraints, senses etc.

PROVOCATIVE EXAMPLES

Media literacy in physical environments

The case studies described in the following (one of which is more extensively reported in [20]) are a series of collaborative authoring practices devised with groups of primary school pupils. They were engaged in working at specific media analysis and production tasks in a physical environment endowed with responsive features through barcodes/barcode-readers or camera recognition tools. The studies aimed at devising practices to rearrange, produce and modify audiovisual recordings in order to create different genres, including documentaries, advertisement and news. Pupils could select, edit and produce multimedia material through a series of collaborative tasks of reading, scripting, interpreting, annotating, editing, video-shooting, and composing visual and temporal recordings. The environment enabled them to do so partly by acting and manipulating digitally 'augmented' physical objects.

In these studies we aimed to devise practices in which media texts are not just 'vehicles' but are employed as workable material and rearranged in physical environments. Such a context demands practical approaches to design. The design case addressed media literacy, and we had to make practical choices to explore and define forms of media access and deconstruction. Matters of aesthetics: form, content, and in particular the creation and disruption of *unity* need to be addressed through practical attempts.

Figure 1. Media co-authoring in space: collaborative 'composition' of media texts in responsive environments

The tangible interface, as well as all the aspects of the 'infrastructure' had only in part been designed in advance. They were developed further in collaboration with pupils and teachers. The description given in [20], focuses on how they enabled creative practices in which media 'access', 'deconstruction' and 'authoring' acquired specific forms. In order to provide a basis for the discussion, here we will highlight the ways in which the designed features were integrated by the participants in their work and enabled specific kinds of cooperative work in the setting.

Physical and digital features of the artefacts can be integrated according to instructions, rules, conventions and procedures, either imposed or made to emerge. Our study addressed the ways in which this can be achieved through practical attempts to engage participants in making sense of new activities. The goal of the practices in the schools was to provide pupils with the necessary skills and resources in order to 'access', 'deconstruct' and 'author' some genres of media compositions through which the subjects taught can be represented. An underlying assumption of the approach is that abilities to critically *read* media texts cannot be addressed fully without favouring also the acquisition of *expressive* abilities of *authoring* with the same sort of media texts. In this sense, we aimed to turn the knowledge of media languages that pupils acquire in their daily life into a resource. 'Tangibles' provided new opportunities to apply such a resource to critical reading and composition of documentaries, trailers, interviews, adverts, reviews and other broadcast or narrowcast media genres.

(1) (2)

Figure 2. Tangibles and interactive features (1): physical, visual, interactive features, and symbols, icons and indexes to digital audiovisual recordings. In this picture the media texts segmented, rearranged and packaged into physical formats are to deconstruct a commercial of crisps (2).

A set of practical tasks addressed the deconstruction of the language of documentaries and other common media 'languages'[4]. In order to train pupils on reading and modifying instances of genres of media texts, we addressed different types of TV news, documentaries and interviews. Inevitably, and relevantly for the discussion in this paper, we aimed at devising open ended tasks and we had to trade off freedom of expression and the imposition of rules and conventions. In contrast with most traditional video editing suites, the setting devised in the study enabled some simple forms of physical manipulation and rearrangement of temporal recordings. Video episodes were mostly represented on physical objects and displayed on screens or projections by physically acting on them, thanks to the interactive features.

Emerging Themes

A major question in devising collaborations around the environment addressed in this case, is what are the ways in which pupils make sense and participate in the definition of their own tasks. An important aspect of their contributions is the emergence of genres of representation. Such genres consisted in conventions and rules of structure and form in putting together elements from different media, and using tangible and spatial aspect of the environment to give unity to compositions For example, some interactive features, as barcodes, where attached to windows, by scanning which in conjunction to a video card, one could have a particular 'perspective' (view) of the corresponding content. The very mediating nature of feature in the responsive environment were adapted to the necessities in local composition tasks. For example, a small table was assigned the local feature of giving a short version of media texts: a barcode was attached to it, by scanning which in conjunction to video cards short versions were screened. Hence, some ways of integrating media composing features in the physical environment caused pupils to perform activities, and opened new perspectives to the composition task. Directing participants in continually reinterpreting the very nature of the tasks suggested new ways of conceiving the mediating role of the responsive features attached to the environment. The focus of our design effort shifted from looking for the 'meaning' of physical actions (as actions on the digital media) to fostering media composing functions that created opportunities for more or expressive embodied actions. This became evident when rhetorical figures – such as a window meaning a 'view' (perspective) and small places or features in the space being used to shrink media objects – became commonly used for their driving force to give meaning to physical actions. A major theme emerging from this case is the directed exploration of alternative activities with a given set of technologies and conventions. In this paper we address the ways in which participants creatively contribute as 'authors' by the appropriation of media texts through tangible activities of transformation. How these transformations are made into genres, and valorised, attributed, appropriated, circulated, depends on how we engage participants in exploring the alternative possibilities they have at their disposal to relating to each other. This showed an example of how the design approach can be developed through performing activities, in such a way that performance is attuned to the underlying forms of interpretation and participation through the media.

Mobile Multimedia in Co-Experiencing the Rally

The experience of a large scale event (e.g. sport events as Rally or Olympics) depends to a large extent on the crowds of spectators, which are generally thought of passively enduring the event and thought as consumers of an increasing amount of accessories, gadgets and services. Most of the current computing applications (including research work) play an important role merely in expositions offering simulators and computer games, which are set apart from the competition. Moreover, while current services and research target exclusively individual spectators, statistics show that spectators visit events in groups. Our research points to how the experience of the event is socially constructed and any application or service could take this into consideration. Current computer applications in large scale events propose a very traditional and social-cultural uninteresting role for computing which is socially alienating as individual visitors dedicate their resources (time, cognitive resources, etc.) away from social relations; it is distractive alienating the visitor away from the competition as the computer games and simulators create a reality set apart from the event.

In the following we report of a field study on two groups of spectators at a FIA World Rally Championship in Finland. Both groups were equipped with camera phones. The analysis of the organization of experience-related activities in the mass event showed a central role of mobile multimedia as a powerful expression tool that contributed in constructing the "rally experience". From this fieldwork we have an initial understanding of the spectator's experience in distributed sport events. Spectators are actively engaged in staging their experiences: navigating and selecting places, settling, creating multimedia records, expressing group image (some wear "uniforms"), interacting within their groups and with strangers. Spectators are organised in groups that display a characteristic image and exchange joke, tips, and information also between strangers.

We observed a rich articulation of situations in which the members of each group created and shared mobile media which contributed to enhance the spectator's co-experience of the rally in several ways.

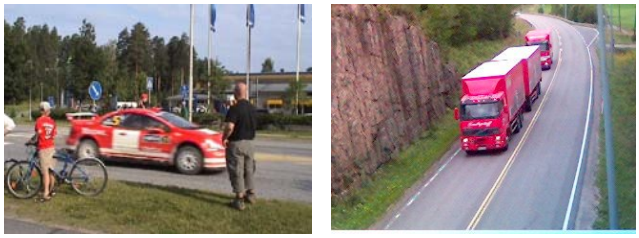

Figure 4.

Figure 5.

Hunting or Documenting. The recording of pictures or videoclips became part of a "hunting" or "documenting" collaborative activity. For example, the groups 'ambushed' the leader of the Rally between two stages and recorded the passing of the car in a video clip (Figure 4). The other

group of spectator engaged in a hunt and documentation for rally car trucks and all the members photographed several trucks including a toy trucks in a gas station (Figure 5).

Competing. After the recording of a picture or a video the spectators often immediately showed it to other members of the group (Figure 5). Pictures and videos were compared and members discussed about shooting techniques.

Joking. The recording of a picture may also be a part of a joke or a game, in the way that it is purposefully created to be part of a playful exchange or interaction: amusing themselves taking a picture of a strange insect on a shoe of one of the member (Figure 5), or making jokes in replying to Multimedia Messages.

Staging and portraying. Pictures were also the outcome of staged situations or portraits that involved the participation of several members.

Emerging Themes

The central point that emerged from the observations is that the mobile multimedia records emerged collaboratively and that the relevance of the media collections of a member resided in the way they were combined with the ones of the other members. Examples are the jokes that emerged from replying to Multimedia Messages in which one message of one member alone is not relevant but the chain of replies in co-authorship conveys the joke. In the same way hunting, documenting, and competing picture records were meaningful when compared and shared among the group and were important to create and experience collaborative situations (the competition, hunting, documenting etc.). Moreover, this example stresses how the production and fruition of mobile multimedia can be intertwined as these media records were mostly relevant during the event while they were collaboratively produced, with the role of heightening the co-experience of the event.

These observations problematise media production models that identify an author and separate the production from the fruition through the media. This example introduces the theme of participative media (and co-authorship). By indicating relations between expression and experience it points to the relevance of a performance perspective in understanding interaction and the role of ubiquitous media.

An Environment for Learning Architecture Design

This case is about the creation of a mixed media environment for the project-based learning of architecture students [5]. As objects of the trials, the environment had a variety of components: physical inputs – sensors, RFID tags and barcode scanners – to animate physical models and diagrams; media players, multiple projectors, and a physical infrastructure including furniture, to create and configure mixed spaces; an application to paint physical models projecting digital texture with a real brush; computational support to record and visualise multimedia paths while visiting remote sites; tools to manage configurations of digital media in the environment and associations of physical inputs and digital outputs. The trials resulted in a variety of performative uses of ubiquitous media.

One student prepared an elaborate presentation of her design ideas for an 'extreme stadium' in the area between Vienna's two large museums. She had prepared a soccer field and two slide shows, with one screen displaying cultural aspects of soccer (images, sound, video) and the second screen displaying her design ideas in the making. The slide show was operated through a sensor that had been fixed underneath a miniature soccer field (Figure 6). In the words of the performer "it was the idea to have soccer-games or soccer tools like the ball, yellow card as sensor tools. Also the architectural project used soccer terminology instead of common architecture words". When the ball touched the goal, a sensor triggered off a reporter's voice shouting 'goal, goal' and the cheering of the visitors. The yellow card was also given to members of the teaching staff to interrupt the presentation with questions and comments. Spectators were invited into an arrangement like in a stadium: "In the presentation them sitting around me, like in a stadium, the whole atmosphere was like in a noisy stadium." (Figure 6).

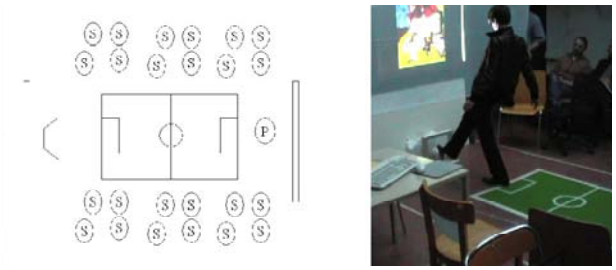

Figure 6. A miniature soccer field as an interface to guide a multi screen presentation where spectators are arranged like in a stadium.

Figure 7. Left a walking path is visualized on a scan of a plan of the building, the red nodes indicate the presence of multimedia recording.

Another performative use of ubiquitous media, can be found in the trials with computational support for visits [19]. Here, tracking technologies using GPS (Global Position System) can be used to record bodily movements outdoors, linking it to multimedia recordings created during the visit. The physical interface consists in being able to "draw lines" with the body, for example walking as in Di Castro's Drawing with Global Technologies an international project in which artists "draw" by their

physical movements ([31], p. 290). This art project provides further indications of how tracking technology, as opposed to pervasive or context aware scenarios, can be used in an expressive way. In our trials, participants were aware that a system was recording their actions to create a representation. In these cases, the walking is not done "unthinkingly". The performative use includes consciously drawing a line, which is performed with the whole body moving around the physical space and that is combined with multimedia recordings of a visit.

Emerging Themes

The theme emerging from this example is to do with looking at interaction as performance to recognizing how expressions are embodied in performances of and in spaces. Performance stresses how meaning is embodied in the careful and expressive arranging of elements in the space how space is performed by bodily presence and movements. Participants create expressions embodied in space, artefacts, bodily movements and media choreographies with a spectator in mind and requiring energy for active participation and consciousness of the acts. Expressions are emergent in events, and are contingent processes, rather then being de-contextualised products. Their contingency resides in particular and personal configurations, as events are the outcome of configurations of space, artefacts and digital media. Events are characterised by a coexistence of doing and undergoing, bodily presence and representation, of experience and action.

FOUNDATIONS

A Performance Perspective

In this section we argue that a performance perspective can be useful in outlining a critical design agenda for interaction. The concept of performance is the object of a variety of studies and contrasting approaches across the social sciences, in anthropology, social psychology, linguistics, etc. The term performance can be taken to address everyday life, and can interest a variety of situations beyond theatrical performances and rituals. Here we choose to follow specific views originating from anthropology and performance art. In the late 70s and 80s, a movement in anthropology focused on understanding the experience and performance of culture. The rise of this movement became known through the book "The Anthropology of Performance" edited by Victor Turner [30]. To formulate a performance perspective for interaction we will gather traits from Turner's work, from the philosophy of Dewey on which Turner based his work. Moreover other anthropological works as those of Eugenio Barba (theatre anthropology), Schieffelin (performance ethnography) will contribute with additional traits. We have also found useful to integrate these traits with views coming from performance art, mostly from the writings and works of a pioneer in this area, Vito Acconci. Here is a summary of these traits to formulate a performance perspective that can lead to a view to interaction privileging novel aspects.

Accomplishment and Intervention. The etymology of the term performance shows how it "does not have the structuralist implication of manifesting form, but rather the processual sense of bringing to completion or accomplishing [29]. A performance is always something accomplished: it is an achievement or an intervention in the world ([25] Schieffelin 1997).

Event and processual character. According to Turner performances are not generally "amorphous or open-ended, they have diachronic structure, a beginning, a sequence of overlapping but isolable phases, and an end." ([30], p. 80)

Expression and Experience. Turner and others proposed the anthropology of experience as an alternative approach to anthropology, where the experience of a culture is studied analysing its expression. Clifford Geertz comments in the epilogue of the book Anthropology of Experience [15]: expressions are "representations, objectifications, discourses, performances" like rituals and other performances, but also artefacts. Turner bases his approach on previous thinkers that addressed "experience": John Dewey, who saw an intrinsic connection between experience and aesthetic qualities, and Wilhelm Dilthey who affirmed that experience urges toward expression and communication with others [28]. Following Turner's anthropological perspective, experience structures expression and expression structures experience in a coherent system of interaction and interpretation of cognition (thought), affect (feeling), and will (volition). Expressions can be considered to communicate experiences (cf. Dilthey). Finally, expressions can contribute to perception and therefore to new insights, either in their act of creation for the "creator" or as embodied artefacts in their material and immaterial qualities for an "experiencer" (cf. Dewey).

Space, artefacts, interactions. Expressions can be configured in space and artefacts in the way they "afford-invite-oblige" interactions. Performance may be considered in the creation of artefacts or architectures, especially in the ways these carry a performative potential that is unleashed through participant's interactions (cf. Vito Acconci explains his Performative Architecture with this words [1]: "The viewer activates (operates) an instrument (what the viewer has at hand) that in turn activates (builds) an architecture (what the viewer is in) that in turn activates (carries) a sign (what the viewer shows off): the viewer becomes the victim of a cultural sign which, however, stays in existence only as long as the viewer works to keep the instrument going." Performance can be, therefore, linked in many ways to expression, e.g., through bodily movements, artefacts or architectures.

Perception, simultaneousness of doing and undergoing. The perspective of Dewey on experience explains the "standing out" of an experience with the particular relationship between doing and undergoing of the experiencer, and with the concept of perception. There is a simultaneousness of presence and representation; in

Dewey's terms a structural relationship between "doing and undergoing" which leads to perception and to new insights. This is contrasted with recognition: merely recognising something already known.

Energy and consciousness. Dissimilarly to behaviour performance, includes more efforts in terms of energy, skill and consciousness (thinking) of the acts. For example, Barba and Savarese [3] distinguishes between daily and extra daily "techniques" (p. 9): "…the way we use our bodies in daily life is substantially different from the way we use them in performance. We are not conscious of our daily techniques: we move, we sit, we carry things, we kiss, we agree and disagree with gestures which we believe to be natural but which are in fact culturally determined… ".

In daily techniques, we follow the principle of less-effort, that is obtaining the maximum result with the minimum expenditure of energy, "extra daily techniques are based, on-the-contrary, on wasting of energy" ([2], p. 16).

Provocations of a performance perspective to interaction.
While traditional human-computer interaction identifies a repetitive task with general validity to be targeted by the design, performance points to the organisation of events that maintain a specificity given by the contingency of meaning and material. While, in general, human-computer interaction relies on recognition, accountability and 'affordances' at the interface, performance focuses on perception and experience. Following Dewey, recognition is something we already know, while perception occurs when we experience a thing that imposes surprising qualities, creating new insights. While dominant tenets in HCI are usability, making an operation easy and efficient, or exploiting affordances so that they can be carried out unthinkingly and making the tool disappear. A performance perspective orients towards experiences where participants are more aware, think feelingly about the artefacts around them and engage in the situation in reflection or perception in action. Dominant approaches, as personalisation, tend to have a view from the computer artefact; here configuration is defined by the properties of the artefact. Performance stresses the centrality of the actor that configures expressions and experience in environments; in this case, configuration is defined by the actor and his situation. Finally, pervasive and context-aware scenarios propose sensing systems that measure and simulate space or recognise and sense situations. In contrast, a performance perspective proposes "sensing humans" with the idea that tangible interfaces should make use of spatiality and materiality to enrich interaction using all senses.

Theatre, performance and design

Previous work
Theatre concepts, theories and performances have been recently employed in several areas of the design of interactive technology. Laurel [23] drew from concepts of Aristotle's poetics and other theatre concepts to address the design of computer interfaces, in an approach based on an Aristotelian theatrical format for the 'orchestration of human response'. Other approaches have gone beyond the application of drama as a metaphor for design, and have applied drama in the practice, either as a fantasy tool, a way to enact and develop scenarios, to test ideas or to stage design events (e.g., [24, 9]). All these approaches have been limited to either developing concepts from theatre writings, or to empirically reproducing the procedures from existing theatre formats, or to relying on *ad hoc* performances, some of which reproduced existing forms of participatory theatre (e.g., Boal's Forum Theatre, as in [24]).

Practice and wisdom from the performing arts
Theatre and the practices from the performing arts can play a different role in design. Instead of *formalising* and directing the design of interfaces with the concepts from theatre theories, or reproducing the *procedures* or the *formats* of some theatre forms, different practical approaches to directing the creative work of people can contribute to shape collective work and creativity. In particular, in the applied arts, as in designing space and interactivity with mixed media, this doesn't need to happen through activities of *staging*, *acting* or *performing*. The vast practical wisdom in the performing arts can be applied by devising activities with interactive technology. Movement, space, temporality, action and play are all often relevant aspects when researching use situations through engaging people in embodied activities. In various practices involving training, directing, performances and critique in theatres, companies of artists, journalists and audiences these aspects have acquired various forms and relevancies, according to quite different traditions, or schools.

Practical approaches to working with constraints
In the traditions of such theatre directors as, for example, Jacques Lecoq, Philippe Gaulier, Keith Johnstone, Peter Brook, Augusto Boal, John Wright, the main concern of a director is to avoid telling to performers 'what to do', but at the same time to drive the creative process in order to make them work creatively and 'make things happen'. The problem of avoiding dictating outcomes is common also in many design endeavours. The problem is well known in most approaches to directing in the performing arts, where the major goal is to devise a performance by making it emerge with minimum control, and being ready to take advantage from *the unexpected*. As the theatre director John Wright says, "this is a shifting and mercurial world where anything is possible and everything has yet to be found. This means that as a director or facilitator you've got to find strategies that are likely to make something happen rather than strategies for getting people to analyse what they think they might do." A particularly relevant aspect to design activities is how the role of constraints can be developed within collective activities.

As already remarked by Laurel [23] the "value of limitations in focusing creativity is recognized in the theory and practice of theatrical improvisation." In fact, her model

of human-computer activity appreciates the role of improvisation within a matrix of constraints. But there are fundamental differences between our case and the way Laurel applies (implicit, explicit, extrinsic or intrinsic) constraints. Her design of software and computer interfaces addresses how to involve users in the theatre of the electronic space and the action of its applications. Moreover, in Laurel's case, constraints can either depend on technical capabilities and the limitations of the system, or (preferably) be established through character and action in the interface. In our case, instead, constraints are not primarily researched as design features, be they desirable qualities or limitations to human's engagement with interactive technology. We focus on the role of constraints as a resource that can be used when directing collective creative action during design, in the same way in which they can become resources in improvised performances following specific approaches, as for example, the practice of Keith Johnstone [21]. Such constraints may also happen to become designed features in a later stage of design. Or, conversely, design features of artefacts and practices they support, may be used as effective constraints in some design trials, as long as they are made to work, as constraints, against a collective drive towards a form of action. But we research their quality during the *exploration* of different human relationships and activities with a given set of artefacts, infrastructures and practices.

Examples of approaches in applying constraints

In order to clarify a way of applying 'constraints', we can exemplify existing practices in the performing arts that apply constraints from different angles. For instance, let's consider specific ways of conceiving work with: *space and contiguity*, *sensitivity, masks*, and *narrative*.

Space and contiguity. One way to work towards framing interpretation of space and movement in theatre is the building of contiguities. Elements can be set to share a space even if they don't necessarily have foreseeable relationships between each other. It is a common attitude to put in place contiguities and constraints to the perception of space, in order to determine the way in which people will have to look or participate in a scene. As a clarification, theatrical framing is what cinema often doesn't need to achieve, as framing in cinema can be researched through camera work, editing and screen projection. Similarly, in everyday life situations, as for example in the streets, people (spectators/participants) cannot perceive everything, and have habits and means of perception to make their own 'editing' and associations. Accordingly, theatre has developed specific devices to achieve "theatrical framing". This theme becomes relevant to technology design in physical contexts and through performance development.

Sensitivity. Some theatre practices (e.g., Boal's [7] work) specifically work on altering participants' senses to train group work. They research the conditions for collective action by modifying senses when leading performing exercises. In design tasks with media senses are limited, constrained, impeded, or transformed by interactive technology.

Masks. Mediating technology can achieve enable action just from the effects of *masking* human action. We can learn from ways of perform through a mask and working with characters. In theatre methods in mask work follow specific principles and traditions. But in general, a director working with masked actors is a designer, designing for conditions of use of mediating artefacts. She specifically researches the *human* characters by covering up people with different sorts of artefacts or devices. In these cases the director is looking for ways of making the mediating artefacts in order for the performance to become more *transparent* to actors' inner traits and personality. In theatre this is usually researched to create fictional character relying upon the 'humanity' of a performer. In our case it becomes a key issue for designing mediating technology, if the 'human' nature of action is what we address when we design technology.

Narrative. Selected theatre practices, improvised drama in particular, provides a key to make narrative relevant in technology design, both as a way of constructing meaning through performances and as ways to describe and make sense of the use of technology. Fostering the creation of narratives follows precise methods and traditions. Approaches to improvised drama aim to develop narratives by the incremental and concurrent contribution of several performers. Directors practicing these methods lead improvisations with actors in such a way to highlight the mysteries and promises of narratives. Creating promises and mysteries of narratives by collective action can be directed by introducing media as constraints.

Conceptualising 'Media': Form and Participation

Design endeavours addressing ubiquitous media cannot overcome most basic concerns of aesthetics, concerning the working of forms in the experience of audiences. With many approaches to studying mediated or unmediated representation, such endeavours share the common concern of identifying what counts as the 'forms' of representations and the nature of 'participation' of both creators and readers of those forms. We move away from structural analyses relying on a definition of *form* as in opposition to *content*. We consider form "in relation to a perceiver" [8, p. 48], and we focus on how it "*cues* us to perform a specific activity." [*op. cit.*, p. 49]. However, we are still bound to the basic problem of understanding *unity* in accessing media and representations in general. At the basis of every task of interpretation or assessment we need to look for *unity*, a system within which elements, relationships, variations, transformations can be identified.

The main concepts we adopt, concerning the 'working' of media, are motivated by broad issues which are commonly addressed in media studies: (a) all media representations are "constructed"; (b) media texts are constructed using a creative language with its own rules; (c) different people

experience the same media message differently; (d) media have embedded values and points of view; (e) media texts can be constructed to gain profit or power. Although our approach is still bound to these concerns, in the context of this paper, we have more specific concerns. When addressing the 'working' of emerging ubiquitous media, we need to rely on a terminology which abstracts away from specific contexts of production and consumption of the common media, from cinema to radio, or the internet. We shall take two main assumptions in setting to address the problem: (1) There is no true, essential meaning, and there can be no exhaustive reading or criticism, which can settle the interpretation of a media text once and for all; (2) We can persist in learning to read media texts differently, and we can help others to do the same by showing the mechanisms that make this possible.

Such concepts as 'authorship', 'access', 'deconstruction', 'genre', 'code' or 'frame' should be reinterpreted from both structuralist and post-structuralist accounts and applied as generative principles in the design of ubiquitous media. The latter questions posed by Foucault suggest a fruitful way to address 'authorship': "…a study that goes beyond the expressive value and formal transformations of discourse, and considers its mode of existence: the modifications and variations, within any culture, of modes of circulation, valorisation, attribution and appropriation." [12]. According to this vision, the traditional questions of structuralist approaches to authorship: 'Who is the real author?' 'Have we proof of his authenticity and originality?' are substituted by questions such as: 'What are the modes of existence of this discourse?' 'Where does it come from; who is it circulated by; who controls it?' 'What placements are determined for possible subjects?' 'Who can fulfil these diverse functions of the subject?'

Common definitions of 'access' and 'deconstruction' can be applied as conceptual tools to describe participation and engagement of readers as interpreters. In the examples, we have seen how, in particular, ubiquitous media permit the appropriation of media texts as tangible activities of 'textual' transformation. In those contexts, the emergence of 'genres' is a central concern for the development of ubiquitous media, because a way participants contributed creatively in design was by the creation or appropriation of genres. As Frow postulates, referring to the general practice of creating intertextual links in several forms in the literary and visual arts: "What is relevant to intertextual interpretation is not, in itself, the identification of a particular intertextual source but the more general discursive structure (genre, discursive formation, ideology) to which it belongs." [14, p. 46] These forms are defined by such features as *repetition* and *motif* and far as they provide some unity, because unity in the composition is what frames peoples' reading. In [20] we observed that the creation of such genres can be motivated by the constraints in cooperation. A similar problem relating to the nature of 'genres' has already been considered in film studies. In fact, if we take common definitions of *genre*, they bind artistic aspects to production and marketing issues, as in Gledhill's [16] definition of genre as a 'conceptual space' in which "issues of texts and aesthetics … intersect with those of industry and institution, history and society, culture and audience." [*op. cit.*, p. 221] Other definitions also describe different genres in terms of their collective significance. Some critics suggested abandoning the term 'genre' itself in favour of such terms as repetition, seriality, cycle, trend and mode. In our studies defining and recognising genres has implications on the working of people collaborations in production, spectatorship and criticism. To those who participate as authors it gives stylistic guidelines. It also provides those who review the work of others with tactical means of evaluating a composition's achievements in terms of the ways it affords particular effects by extending, challenging or reinterpreting particular features of a genre [8]. The question remains of whether the concept of genre can be effectively applied to explain how authorship relates to fruition. In media studies, concepts concerning genres have been applied as means to link the working of media texts as ends of creation and as ends of consumption.

A PROGRAMMATIC MANIFESTO

Ubiquitous media are introducing in a variety of aspects of our life niche or fringe applications. Inspiring examples of ubiquitous media are increasingly emerging in art installations. Recent research focuses on producing dynamic, interactive, non-linear narratives (e.g. interactive storytelling), or explores technologically innovative, immersive environments that diverge from conventional screen formats. There is the need to devise and study such applications looking for methodological and pedagogical implications for the development of ubiquitous media in general. Creative practices in the arts can fruitfully drive practical and conceptual attempts to address the Performative Development of such applications.

Performative…

We focus on traditions and methods in the performing arts that: (a) are loosely structured, (b) tend to put meaning at the end of the process, (c) avoid planning and control, and (d) aim to achieve 'acting as play'. This provide a key to address interaction as performance. Interaction can be devised and studied as part of events aimed at generating new insights for participants (interchangeable performers and spectators) privileging sense experience. Events are the outcome of configurations of space, artefacts and digital media, in which doing and undergoing, representation and bodily presence are simultaneous. These can be alternatives to established human-computer interaction tenets: the notion of event is an alternative to the notion of task; perception in Dewey's terms replaces recognition proposing expression as an alternative to accountability and usability. Implications include configuring and staging space instead of measuring and simulating. Situations can first be devised

and staged instead of just sensed and recognised. We need to privilege the sensing and sensible human '*interpreter*' over the sensing and '*once-and-for-all-interpreted*' system. This means approaching the development of artefacts, together with the cultural practices they can enable and support, through practical attempts which are not immediately directed towards functionalities or interpretation of technology.

...Development...

The object of our design interventions is to engage people in creative activities in which a major contribution in their imaginative work is to create new human relationships while they tackle with the urge of socially determine their presence in a newly created space. These attempts have a strong explorative component and focus on the social aspects of the creative achievement. We have observed the following consequences in the practical accomplishment of our design goals, which call for specific methods in the 'performative development'. (1) First, our design work in researching new collaborative activities – those arising through and around artefacts and practices – extends to the point that alternative 'relationships between people' are in themselves an objective of the design interventions. In other words, given the same tools and tasks, we look at alternative ways in which people can relate to each other. Such design endeavours address the continued *exploration* and nourishing of human relationships. (2) Secondly, even though such new relationships and emotional spaces can acquire a relevance in the experience of participants, and therefore in design, they are not necessarily functional, nor can they always be semantically interpreted relating to the practices or the artefacts to which the design interventions are addressed. But the contribution in our design effort is not in their functional or semantic relevance, but in the new forms of engagement that arise, either immediately or in subsequent trials inspired by them. (3) Finally, such a design process can unfold with the guide and inspiration from practical approaches in the visual and performing arts even without necessarily engaging people in any *acting* or *performing* activities, nor by embedding concepts from the arts in designed features. Performance and theatre practices, for instance, can contribute to analysing and carrying out practical attempts to achieve collective creativity.

Practical wisdom and guidance from theatre practice

Methodologically, performance implies the uniqueness and contingencies of "happenings". This contrasts with positivistic movements that strive towards repeatable methods and techniques in design. Performance contributes with a situated (place and time), participative, and experiential epistemology. In previous work, we have shown how performances, by supporting the creation of expression and their experience, can have three goals in Interaction Design: exploring, communicating, testing. These are achieved with at least three important resources: a performance space that enables the formation of expressions, props to encourage expressions, and interactional creativity [18]. Beyond naïve literal applications of theatre techniques or procedures to design contexts, in this manifesto we are able to say more about what aspects of the practical wisdom from theatre practices are promising to foster the emergence of practices in ubiquitous media. Moreover, we indicated promising concepts that can be translated from theatre practice to design and applied as metaphors, relating to the use of *constraints* in devising collective action, introducing *contiguities* or altering peoples perception of space, working on the *masking* properties of media, altering or limiting *senses*.

...Ubiquitous...

According to a perspective on anthropological notion of performance, and relying on creative practices in the performing arts, the very meaning of ubiquitous, acquires a new meaning. By 'ubiquitous' we end up meaning 'every where', but in relation to how 'mediating' features ubiquitously affect the dimensions of performance reviewed above: in relation to how media work as virtuous constraints in fostering creativity, frame our perception of space by building contiguities, alter our senses, or make people's traits more transparent through masking behaviours. Here we move away from the distinction of form and content, of interface and data. Current approaches mostly distinguish between media content (movie, song, presentation, video game) and interface or medium (TV, computer screen, keyboard and mouse), with one medium or interface being used for all content objects.

...Media

The definitions we have indicated above in order to address the *mediating* aspect of technologies have referred to a broad problem of identifying form, not in opposition to content but through inspecting performed actions. We related to audiences' common seek for unity within interpretable representations, and pointed to the critical role of emerging genres in enabling participation. The ultimate advantage of reviewing the terms cited above is a gain in clarity in addressing problems of *access* as deconstruction, and elucidating the various forms of authorship that ubiquitous media can enable. Our agenda heavily relies on the generative roles of such principles from media studies. The perspective in which we frame and apply them is that of authorship and participation as a form of skilled appropriation. Foreseeable applications for this design agenda considers ubiquitous media as promising tools for an intuitive and embodied understanding of complex and subtle mechanisms in learning to read, transform and manipulate media.

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