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iSport: Varieties of Physical Interactions in Social Contexts

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Abstract. The iSport project is exploring the design and interaction potential of movement and physical interaction in social contexts. The project deals with three distinct areas of application all within the world of sports: elite athletes training, spectator experiences at sport events and physical education in schools. The goal of the project is to create interactive prototypes that will enhance and support the activities already at play in the three contexts and in that effort explore new ways of interacting with ubiquitous computing technology.

Keywords: Kinesthetic empathy interaction, elite sports, learning, social interaction, play, spectator experience, collective action, design research.

1 iSport

Today it is becoming a well-known and generally accepted thesis that human beings perceive, learn and experience through bodily movement to the same extent as through purely cognitive means [1]. George Lakoff and Mark Johnson state "Our sense of what is real begins with and depends crucially upon our bodies, especially our sensorimotor apparatus, which enables us to perceive, move and manipulate..."[ibid]. This means that our bodies are the foundation for the way we experience and interact with our surrounding.

The iSport project is focused on exploring the challenge of designing and using computers in ways that enhance and support physical and social capabilities and experiences. The project is divided in three areas of interest where the central notions of movement and sociality are essential to all three. As emphasized in the call for this workshop, there is a huge challenge in the field Human-Computer Interaction of designing a better relation between computational functionalities and the physical and social context that these are used in. Many of the activities we are engaged in as social beings are situated in physical space and almost all of our social skills are developed and connected to meeting people socially in physical space [2].

The three areas in the iSport project are all dedicated to exploring physical interaction in social context and how they are connected and can be supported. However, in each area the context, means and goals vary a great deal, even if they are

all located in the world of sports. The domain of sports have been chosen since movement and physical interaction is already in focus here, making it an ideal context for working with applying tangible and physical interaction that goes beyond the facination of material qualities and start focusing on how to enrich the users bodily and socialy goal through interaction. Our job as designers and researchers is to introduce technologies and interaction forms that fit within the existing setting without becoming disruptive to the overall goals of the social contexts.

From the introduction of tangible and physical interaction [8] the research has been focused mostly on exploring the potential of these interaction forms themselves. Now there is a general move towards a utilization of the knowledge that has been uncovered in a range of application areas. The iSport project seeks to participate in this exploration with its focus on these three areas already devoted to physical interactions and movement by designing technologies that physical and social engage users.

The iSport project is engaging the issues of social and physical interaction on a broad front to investigate and develop new forms of interactions and novel technologies to support these interactions that will enable better results, better learning and better experiences.

1.1 Goals and means in the interaction

The goals of the three areas of application in the iSport project are very different, but they stem from the same core issue of exploring the potential of movement and physical interaction in social context.

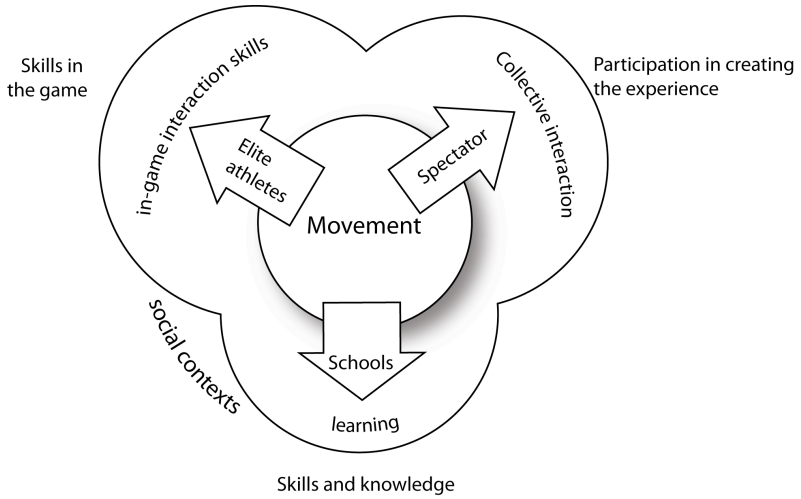

Figure 1. The iSport project is organized around exploring the potential of movement and physical interaction in various social contexts

Each part of the project explores this potential in a given social context and seeks to introduce digital technology in order to support the attainment of the purposes or goals already present in that context.

For the competitive sports-area the goal that our users are working towards is to achieve better results when playing the game against real live opponents. In the interactive sports – interactive in the sense that a player interacts directly with another person – the individual's ability to pass, trick or feint an opponent is central to success in the overall game. This skill needs to be integrated in the athlete's physical psychomotor skills through intense practice or real match experience. So the overall goal is to win the matches by enhancing in-game kinesthetic empathy interaction skills [3], and the mean to achieve this is physical training and physical interaction. The artifact we are designing must support this particular activity as a piece of training equipment that focus and isolates the social interaction of standing in front of an opponent and try to trick him in a game of skill.

For the spectator part of the project the goal of the users is to create the best possible support for their team, including dominating or out-cheering the visiting team's fans. This collective action is deeply based on the physical experience of being part of the crowd and the physical activity of the audience as a whole. Our challenge here is to design an artifact that presents interaction possibilities to spectators without limiting their range of expression.

In the school-area of the project the goal in the social context is, of course, to teach the pupils skills and give them knowledge of a particular subject matter. We seek to do this through exploring how physical education can be combined with other subjects in school like primary and secondary language, natural science or media.

2 Exercising Kinesthetic Empathy Interaction

The first part of the project is focused on developing a way for elite athletes to train their psychomotor skills through what we call kinesthetic empathy interaction [3] – basically the man-to-man situation where two persons compete opposed to each other often as part of a larger game. In a range of disciplines these types of skills are central to the overall success on the field. We focus on team handball and basketball as the sports where we want to develop a piece of interactive training equipment for honing the athletes' skills within this specific situation.

Everything an elite athlete does in training is done in order to train his or her skills at one particular aspect of the game. This aspect is isolated from the actual game activity and an exercise is made where the particular skill is worked on repeatedly. We have observed that the training sessions of a range of sports are organized in the same way; going from warm-up, over skill training, discovery learning to game/match. Our design space is located in the interplay between specific skill training, where the athlete repeats specific exercises to build muscles or speed, and discovery learning, where the athlete tries new running patterns, combinations, shots etc. Kinesthetic empathy interaction is not only a simple bodily skill that can be trained isolated like speed or power. Because it involves another human being as direct opponent, there is a continual aspect of discovery learning included in

increasing the skill. From the start when we decided to focus on kinesthetic empathy interaction, we also decided to design a system that would require two or more users to test each other's skills and play in direct confrontation or collaboration, and not merely a system that simulated the opponent.

This furthermore provides an interesting design challenge, since it is difficult to make an objective measure of one participant's progression with this particular skill, when the skill is always trained in collaboration with another person. For the elite athletes it is very important that they have a clear understanding that an exercise will enhance their chances for overall success in the actual game.

In participatory design sessions we have had both coaches and athletes themselves give us their design proposals on exercises and training installations that could train kinesthetic empathy interaction. Groups of team handball players and other athletes collaboratively designed proposals for installations and exercises that could pitch two or more opponents in front of each other creating an motivating game-play that could be included in their normal training.

3 Spectator Participation

The second part of the project is focused on the experiences the rest of us have with elite sport, namely as spectators at sport events.

The fan culture around the bigger sports like team handball and football is highly engaging both as a physical and as a social activity. The participants of a fan group are highly devoted to the success of their team and engage in a wide range of coordinated and uncoordinated activities to express their support.

In the iSport project we are looking towards these activities as a place to explore collective action and communication, and as an area where we can work with integrating technological platforms that will support the social activities of the spectators. Today the technological support at sport events is focused on conveying athletic achievements and statistics from the game to the spectators. However, for the spectators there are more to the game than just passively watching it as it unfolds.

In our field research [4] we found that there are several different ways of being spectators to a sport event. However when we look at the highly engaged fans we see two main types of activities: First, they cheer in order to influence the game hoping their team performs better, scold the referee for bad calls or otherwise comment the game as it unfolds. The focus is on the game.

The other type of activity is focused on the other team's fans. There is an ongoing battle between the two groups of spectators supporting either side. The two groups are constantly trying to out-do the other in order to dominate the arena. This type of activities is much more focused on the group itself and entails an almost tribal battle for territory with colors, flags and singing and shouting. There is a high degree of self-representation involved in being a spectator. They dress in team t-shirts, they paint their faces, and in our research we often found "cheer-leaders" not watching the game, but fully focused on getting their fellow spectators to cheer more devoted. It seems, that the spectators is more engaged in the overall atmosphere than in the ongoing athletic activities on the court. That does not mean that the experience of

spectating is separated from the athletic activities but rather that it is an integrated part of the sport event itself.

Both types of spectator activities are of course highly linked to the game and where it takes place. Our focus in this part of the iSport project is to develop a platform that will support the spectators' experiences of being at the game. Spectator activities are heavily dependant on the co-experience [5] of the involved participants, and when designing interactive technology for this setting it is important to support the participants in creating their experiences themselves [ibid.].

As opposed to the Elite-area in the iSport project, this spectator-area is not so much focused on sensing individual movement, tracking the human body and manipulating physical objects. However, spectators' activities are still highly physical and deeply connected to being present in the space where the sport is taking place. Spectators also use the physical environment to create the best possible support for their team by standing in the place where their song can be heard the best or jumping up and down on the stand to create a high thumping sound. It is activities such as these that our system should support and enhance without taking focus away from the actual social context and the event taking place.

4 Learning through physical and social interaction

The third and last leg of the project is focused on exercise and physical education in schools and other institutions for children. We are here working with developing new and more engaging ways of getting the kids to explore their physical capabilities and combine this with learning in other subjects in school like physics, chemistry, mathematics, own language, secondary language, media etc.

Howard Gardner's [6] concept of several different intelligences that can be utilized in learning is one of the central focus points in this part of the project. In the context of Danish schools there is a big move towards cross-subject teaching. This poses a challenge for creating new curricula that can contain several types of knowledge and new teaching materials that can support the crossover of two or three subjects. For physical education there is also the challenge of making new sports equipment that can elicit data or in other ways enable new perspectives on physical activities and connect it to other curricula.

The goal here is to connect kinesthetic intelligences with logic or creative intelligences in order to reach better performance in learning. The Center for Interactive Spaces has previously developed an interactive floor that is currently in use at a local school for teaching everything from language to mathematics at a range of age-levels [7].

In coming research activities we will involve pupils as well as teachers in developing ideas for applications and discovering potentials for design in the context, and also have these participant help in testing and improving the designed concepts as they are build.

5 Conclusion

The iSport project is an experimental design exploration of aspects of purposeful physical and social activities. The competitive sport-part of the project explores individual training of kinesthetic empathy interaction, which is a highly specific social sport-related competence. Through a future design of training equipment we enable elite athletes to train this competence and see their improvement over time. The spectator-part of the project is more focused on the social activity of being a spectator at sport events. Here we are faced with the challenge of designing a system that connects the intense physical activity and experience of the spectators to a meaningful interaction with a system that allows the spectators to co-create their experience. Lastly the school-part of the project is focused on designing a platform for utilizing physical skills and activities to learn other subjects in schools.

The core of all these explorations is to make a better connection with physical activities – socially and individually – to the computational capabilities that are offered through the technologies we design. The reason for doing this is that, in all three areas of the project, there are huge improvements to be made to the experience and outcome of the participants in the activity, be that learning in schools, achievements on the handball court or for the collective actions of the spectators on the stands at sport events.

Our overall goal in the iSport project is to explore how physical and social skills can better be integrated and utilized in the use of computational artifacts.

References

1. Lakoff, G., and Johnson, M., *Philosophy In The Flesh*, Basic Books, New York, (1999).
2. Goffman, E., *Behaviuor in Public Places, Notes on the Social Organisation of Gatherings*. New York, The Free Press, (1963).
3. Fogtmann, M. H., Kinesthetic Empathy Interaction – Exploring the Possibilities of Psychomotor Abilities in Interaction Design. In *Proceedings of the Second International Workshop on Physicality*. Lancaster, (2007).
4. Nielsen, R. V., Spectator Experience - are they watching the game at all?, in *Participation and Innovation, Proceedings of SIDeR 08,* eds. Matthews, B., Buur, J., Sønderborg, Denmark, (2008)
5. Battarbee, K. (2003). Defining co-experience. *Proceedings of the 2003 international conference on Designing pleasurable products and interfaces*. Pittsburgh, PA, USA ACM Press.
6. Gardner, H. *Frames of Mind: The Theory of Multiple Intelligences*. Basic Books, New York, 1983
7. Grønbæk, K., Iversen, O.S., Kortbek, K.J., Nielsen, K.R., Aagaard, L.: " iGameFloor - a Platform for Co-Located Collaborative Games". In proceedings of the International Conference on Advances in Computer Entertainment 2007, 13.-15. June, Salzburg, Austria, pp 64-71
8. Ullmer, B. and Ishii, H., "The metaDESK: Models and Prototypes for Tangible User Interfaces," *Proceedings of User Interface Software Technology (UIST '97)*, ACM, Banff, October 1997, pp. 223-232.