Breakout for Two: An example of an Exertion Interface for Sports over a Distance

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ABSTRACT

Breakout for Two is the first prototype of a physical, exertion sport that you can play over a distance. We designed, developed, and evaluated Breakout for Two that allows people who are miles apart to play a physically exhausting ball game together. Players interact through a life-size video-conference screen using a regular soccer ball as an input device. In a test of 56 volunteers, the Exertion Interface users said that they got to know the other player better, became better friends, felt the other player was more talkative and were happier with the transmitted audio and video quality, in comparison to those who played an analogous game using a non-exertion keyboard interface.

Keywords

Exertion interface, physical interface, sports interface, social bonding, computer mediated communication, interpersonal trust, funology, sport, video-conferencing

INTRODUCTION

"You can discover more about a person in an hour of play than in a year of conversation" (Plato, 427-347 BC). This quotation conveys the motivation for our work perfectly.

BREAKOUT FOR TWO

How cool would it be if you could play football with your friend, even though he just moved miles away? What about playing tennis with a famous tennis player on another continent who is preparing for a grand slam?

With breakout for Two, you can. Breakout for Two is the first prototype of a physical, exertion sport that you can play over a distance.

Figure 1: Breakout for Two

It's a cross between soccer, tennis, and the popular computer game "Breakout". The players share a court, but stay on their side of the field, like in tennis. They see and hear each other through a life-size videoconference, which feels like they're separated by a glass wall.
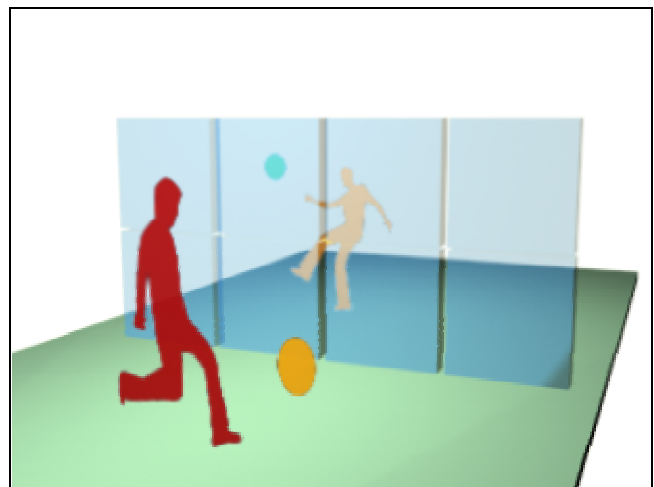

Figure 2: Feels like a glass wall between the players

They both have a ball which they can throw, kick, smash, in whatever sport they agree on – for example tennis.

Figure 3: The system also works with tennis balls

They have to strike semi-transparent blocks, which are overlaid on the video stream. These virtual blocks are connected over the network, meaning they are shared between the locations. If, for example, one player hits the block on the upper left, the block on the upper right is hit for the other player. The goal is to hit all the blocks before the other player hits them. You win if you hit more blocks than the other player.
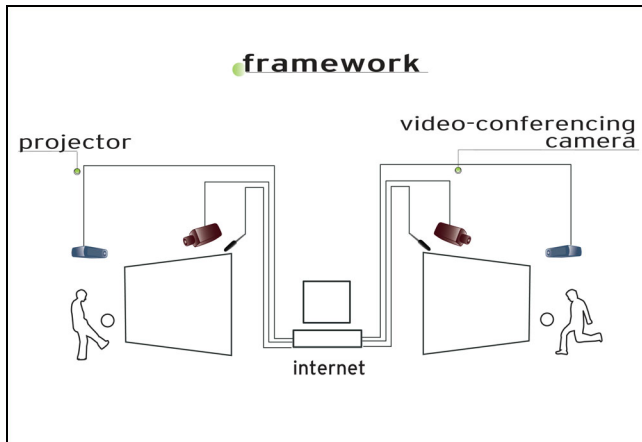

Figure 4: Technical framework

EXERTION INTERFACE

Breakout for Two serves as an example of an Exertion Interface, an "interface that deliberately requires intense physical effort" [1]. It aims to recreate the same bonding and team spirit experience of traditional sports except over a distance; not with email and instant messengers, but with real balls, sweat, and exertion.

EVALUATION

56 volunteers evaluated the system. They did not know each other beforehand, and played Breakout for Two for half an hour. These players reported that they got to know the other player better, became better friends, felt the other player was more talkative and were happier with the transmitted audio and video quality, in comparison to those who played an analogous game using a non-exertion keyboard interface ($p<0.05$ for all these results) [2].
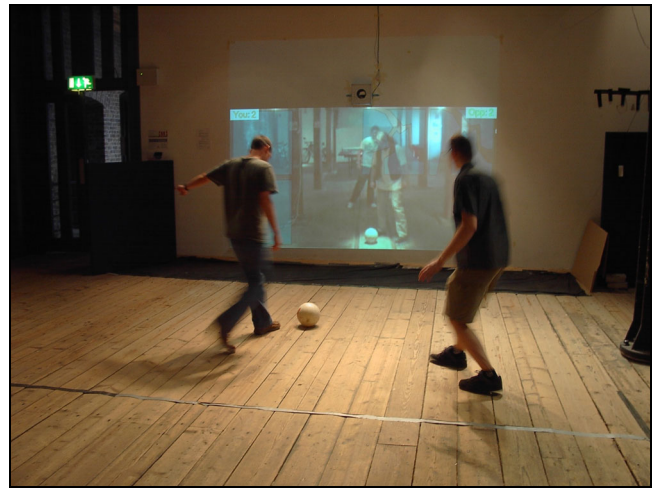
Figure 5: Breakout for Two also supports two-on-two

CONCLUSION

Breakout for Two is only one example of an Exertion Interface, which supports Sports over a Distance.

Augmenting a gaming environment with exertion will greatly enhance the potential for social bonding, just as playing an exhausting game of squash or tennis with a new acquaintance or co-worker helps to "break the ice" and build friendships. You can now have fun playing sports with your local *and* remote friends!

Figure 6: Happy winners

REFERENCES

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