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# Presence Based Play

## Towards a Design for Large Group Social Interaction

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# Presence Based Play: Towards a Design for Large Group Social Interaction

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**Abstract:** This poster addresses the fundamental research questions that guide our first steps in the design of innovative playful activities for large numbers of people, based primarily on their mere presence. Our research framework draws upon the areas of multiplayer games, instant messaging, social psychology and group behaviour. We introduce the concept of 'presence based play' to describe the way social interaction based on the simultaneous presence of many people can be enhanced as a meaningful and engaging experience in the networked world. Our design approach to 'presence based' multiplayer games is illustrated with a prototype which we developed to use as a testbed for a series of experiments.

*Keywords: Presence; Social Interaction; Multiplayer Games; Crowd Behaviour; Social Networks*

## 1. Introduction

Current advances and convergence trends in communication technologies and the emergence of 'always online' information appliances are changing the ways we communicate with other people. A sense of 'being connected' or 'always in touch' is present even when one is not directly interacting with technology itself. In the networked world, 'presence' awareness can be achieved with various communication tools, Instant Messaging being most commonly used.

Presence information can include a variety of aspects, such as availability, location, communication preferences, device capability (Chakraborty, 2002), as well as more abstract concepts, like a person's intention and interest (Emilsson, 2001). With the increasing number of networked appliances sharing presence information, our communication practices are changing and reflecting the context of our daily life activity.

At the same time, new interesting forms of play and social interaction are emerging, such as location-based wireless games (Vogiazou, 2002b). People can 'cooperate in ways never

before possible' (Rheingold, 2002) through the use of mobile and pervasive technologies.

## 2. A research framework for crowd 'presence' and play

We are interested in defining the notion of presence on a massive scale. What are the effects of 'presence awareness' for large numbers of people and what kind of playful group interactions or interesting social behaviours can emerge? As Donath (1996) asks: 'Is there a design that would make palpable the sensation that one was indeed on-line in the company of millions of other people?'

Our studies begin with small groups (tens of participants) with the long term goal of investigating the simultaneous playful interactions of hundreds or even thousands of people. We focus on aspects of motivation, scalability, visual communication and collective behaviour.

Our research draws inspiration from a variety of areas: online and wireless multiplayer games, interaction design, instant messaging, crowd behaviour and social psychology. Our analysis of existing massively multiplayer games (e.g. *Asheron's Call*, *Everquest*)

suggests that there is no example in which a player can experience the genuine large-scale synchronous participation of hundreds of other people *in the player's own perceptual space*. This is despite the fact that there may of course be thousands of people playing the same game online at the same time. Players in massively multiplayer games are typically fragmented into separate manageable regions (Vogiazou, 2002a). While a large number of players in one perceptual space is usually considered a design restriction in professional game development, we would like to reverse this to be an advantage: we aim to recreate a 'crowd' atmosphere and encourage playful social interaction in a manner that might even be perceived as frivolous or superfluous to conventional game-playing 'goals'.

In the Instant Messaging world a person's availability or state of activity is indicated by abstract icons. One of the key design challenges in our experimentation is the use of presence information in a new context. We want to see how abstract, non-verbal visual information (e.g. colour, movement or shape) can communicate a person's actions and social behaviours within a large group game. Innovative research in group collaboration tools (Erickson et al, 2002), chat room design (Viegas & Donath, 1999) and location-based Instant Messaging (Eisenstadt & Dzbor, 2002) has shown that abstract visual representations are very scalable and efficient to use.

We believe that a multiplayer game based on changes in individual presence 'states' can involve many participants and encourage collective and possibly serendipitous activity, *depending largely on the peripheral awareness of others*. Hence, we introduce the concept of

*presence based play*, to include all possible playful interactions among large numbers of people, simultaneously present in a networked environment.

In the process of identifying those elements that would make such interaction an engaging social experience, we have also been inspired by children's playground games. The basic challenge is to understand and recreate the sense of instant 'fun' in some of these games that occur spontaneously. This happens, for example, when one child challenges another, while walking in the street in a group, to play a game of 'tag' and they then start chasing each other. In the spirit of spontaneous playground 'tag', we have been developing a close analog that is more suitable for onscreen interaction: a 2D Bumper Car world. Other bumper car games exist (*Bump, Bumper Wars, etc.*), but we are specifically designing a new scalable variant as a starting point to generate ideas about possible social behaviours – for instance challenging other people, using colour attributes to form alliances and to encourage group identity. In our study, we have addressed both the aspect of visual perception of large groups of people and also the issue of motivation for participating in a virtual 'crowd'.

Several social psychology theories have been influential in our research so far. A classic experimental study of non-cooperative behaviour was undertaken by Alexander Mintz (Mintz, 1951) to explain the striking effects of crowd panic. Mintz's study showed that such non-cooperative behaviour is not the result of panic-driven emotional excitement, but that people adjust their behaviour according to their expectations of the behaviour of others and their perception of a challenging

situation. Other theories have attempted to explain anonymity effects when being part of a crowd. The recent Social Identity Model of Deindividuation (SIDE) explains strong group cohesion effects in visual anonymity situations in computer-mediated communication. This study shows how perceptions of self and others are shifted from the personal to the group level, increasing attraction toward the group (Lea, Spears & Groot, 2001).

There is also another, very interesting and challenging space. Drawing inspiration from the Mexican Wave phenomenon (Farkas et al, 2002) and spontaneous crowd behaviour, we have been fascinated by the idea of emergent (unplanned) behaviours through unstructured play, much like a jam session where each individual contribution affects a collective outcome.

In respect to our definition of *presence based play*, we are interested in the following fundamental research directions:

a) *Motivation*: to discover how participation in an online 'crowd' can be an engaging experience.

b) *Scalability and physical constraints in gameplay*: to increase the number of game participants in order to define the limits and see if truly massive participation is possible.

c) *Visual Communication*: to see to what extent abstract visual communication within a game, such as a change of 'presence' state indicating behaviour and intention, can be successful. Our aim is to identify challenging situations where group communication is required and see whether such non verbal communication is effective in assisting players to coordinate collective action.

d) *Cooperation and group behaviour*: to experiment with the potential of group formation and flocking behaviour, where cooperation among players is critical in order to achieve an outcome.

Our parallel aim is to address the further challenge of emergent and unstructured behaviours, mentioned above. For this purpose, we experiment with less goal-oriented games, based on spontaneous colour changes and movement.

### 3. The Bumper Car Game Design

In our first online Bumper Car game experiment (Fig.1) implemented in Java, each player's car is randomly assigned a colour and appears in the 'playground' area. There are four colours in total: orange, green, blue and purple. A player can see other cars with their player's name tag, drive around and bump into them. During the game, players can change their cars' colour by pressing an appropriate key (e.g. B for blue, O for orange etc). In order to recreate the atmosphere of many more people playing, we also provided an option to add randomly moving 'bot cars'.

To enhance motivation, we introduced the 'challenge': by clicking on a 'rival' car of a different colour each player can initiate a 'challenge'; a line is then drawn between the player and the challenged car, which stays for a limited time, depending on the initial distance of the two cars. Within this time limit, the player who initiated the 'challenge' must reach the other car and bump into it to gain points. Challenges cannot be placed between cars of the same colour, since they are considered 'allies' (if a car changes its colour during a 'challenge' this does not affect the final outcome).

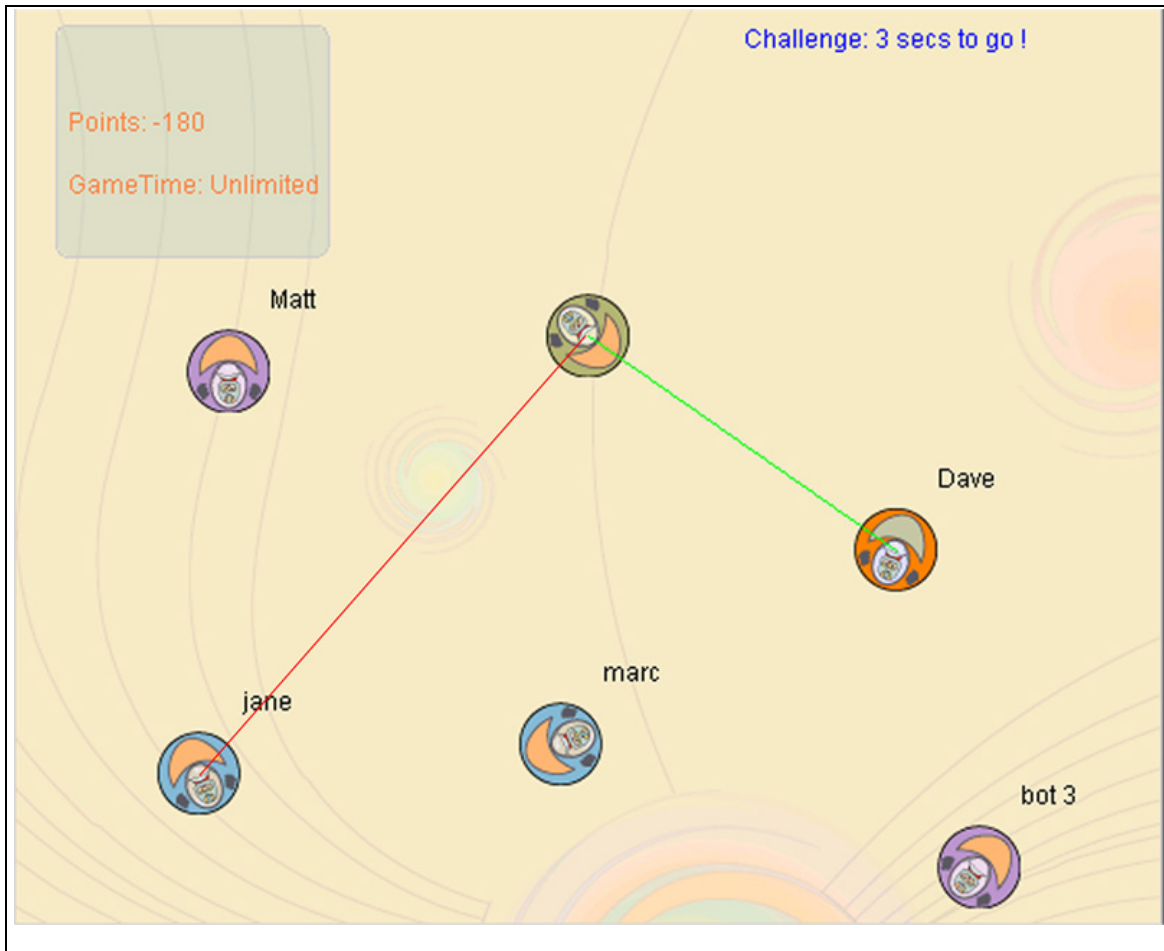


Fig. 1 The close-up view of the game, where we can see the player 'challenging' Dave and being 'challenged' by Jane at the same time

In order to communicate the presence of all people playing simultaneously, we provided the facility of a single overview map, where cars are scaled to small circles or dots (Fig.2). An inherent tradeoff we are studying is the balance between (i) the benefit of being able to interact while observing the *whole world gestalt*, on the one hand, vs. (ii) the disadvantage of having less of the *immediacy and salience* of seeing one's own car and region in the close-up view. Many massively multiplayer games aim to provide both the salient view and an embedded radar view, but typically cannot possibly show the whole world gestalt and allow players to interact within it.

#### 4. Player Feedback

Fifteen people (lab colleagues) with varied gaming experience participated in three game session experiments (approximately 20 minutes each) in order to evaluate the game. In every session between eight and twelve people were logged in and ten or so 'bot cars' were randomly moving.

Twelve out of fifteen participants gave positive comments about the game: 'instant fun', 'I liked the graphics simplicity', 'fast and addictive', 'easy to pick up'. One player in particular said: 'It's good fun to bump your boss or colleague!'.

Nine out of fifteen people reported they would like to have a more explicit, meaningful way to team up. In particular, players suggested they wanted to ‘chase other cars together’ and ‘form alliances against others’. Some players proposed ideas to enhance group identity and collaboration – for instance, ‘knowing who else is being chased by team players’. Although such strong goal-oriented design is clearly desirable in typical game development, this nevertheless falls outside the remit of the (nearly goal-less) presence based play we are trying to achieve.

People used the colour change facility in various ways, for example to trick other people in order to challenge them unexpectedly or to avoid revenge by players they had just challenged. This is an example of an emergent behaviour that was not part of the original game design.

Eleven out of fifteen people reported they found the map view useful. Players used the map view to locate others, but then switched to normal view to place their challenge, since it was not possible to place challenges in the map view. Thus, it became apparent from users’ feedback that full game functionality should be provided in both views. However, we know that at some point there has to be a limit to the ‘playability’ of very small bumper cars on very large maps. The key is to define this limit as we scale up the game, while bearing in mind the tradeoff mentioned earlier between the experience of the whole world gestalt and the immediacy and salience of the perceptual view of one’s own car.

## 5. Next Steps

We have only begun on this new path towards *presence based* large scale networked interactions – and clearly face many hurdles. However, the implementation of the first version of the Bumper Car game has definitely proved to be a good starting point and a valuable testbed for further experimentation. The idea of self-organised groups has been influential from the early stages of this research. The next step is to discover whether it is possible to have successful group formations within the Bumper Car game. We are particularly interested to see how people will coordinate their movement and targets as a group, with minimal and purely visual abstract communication.

In the next series of experiments we will also vary the game context to present a series of different challenges, each addressing some aspect of the broader scope of our research. Racing challenges requiring cooperation and ‘colour-change group improvisation’ are two game experiments currently in progress. We aim to address a particularly difficult tradeoff: on the one hand we want to study group behaviour, motivation, collaboration and visual communication in a large-scale gaming context, but on the other hand we aim to do this by creating a ‘playfield for emergent presence-based play’ where we need to *restrict* normal channels of communication and stereotypical game-playing goals.

Fascinated by the potential of emerging crowd behaviours, we would like to design playful applications that people could use to surprise us with spontaneous, synchronised collective actions, such as changing colour in a particular way to achieve a rhythmic effect. Toward this end, we aim to

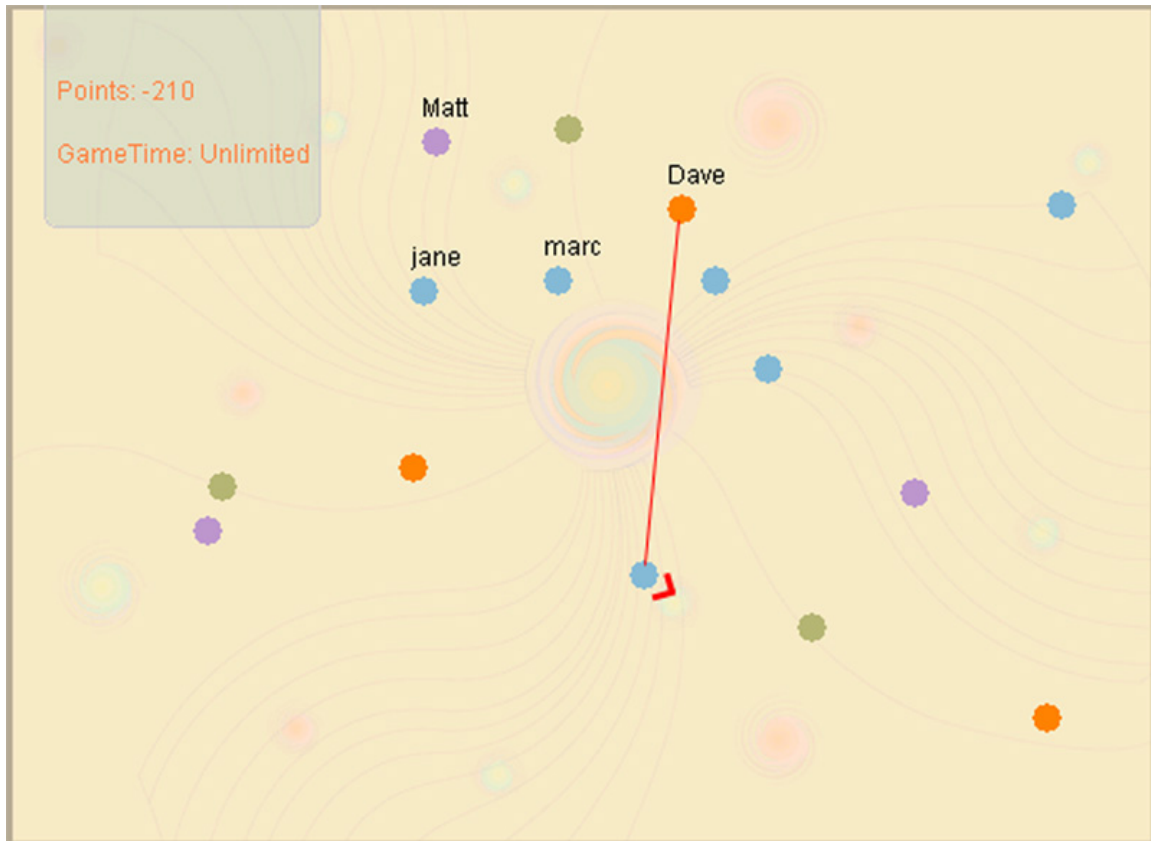


Fig. 2. The map view of the game. The player has been challenged by Dave and we can also see many randomly moving bot cars

further develop the design via iterative refinement and user feedback, and extend its scalability on the grounds that some behaviours can only emerge when a ‘critical mass’ threshold is surpassed—identifying this threshold would itself be a valuable contribution to the concept of presence based play.

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