



# COLLOCATED GAMING: ANALYSIS OF SOCIAL RELATIONS IN GAMING THROUGH INTERACTION ECOLOGIES

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## Keywords

Collocated interaction  
Interaction ecologies  
Social relations  
Game studies

The first computer games were mainly multiplayer games, and people were coming together to play them. Although the concept of the multiplayer games shifted towards online multiplayer games, which allows people to play from different locations around the globe, recently the collocated multiplayer games are regaining attention. This paper offers an analysis of collocated multiplayer video games, by discussing cases that introduced original interaction modalities. The social relations created within these interaction ecologies have a fundamental role in the history of computer games. To understand how these social relations are conditioned by design choices, five factors have been determined: players' population, characters' relationships, control, controllers and screens. These factors constitute a framework that which enables designers and researchers to analyse video games from the perspective of collocated gaming.

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## 1 INTRODUCTION

### 1.1 EARLY HISTORY

During the early history of video games, games such as *Tennis for Two* (1958), *Spacewar!* (1962), *Pong* (1972), and its follower, *Elimination* (1974) explored different multiplayer modes. These arcade and experimental games served as a base to create and show the great potential for social interactions in the area of computed gaming. For example, Higinbotham created *Tennis for Two* in order to give hands-on experience of one of the technologies available in the Brookhaven National Laboratory in Upton. Students, who were among the most common visitors, appreciated the idea to the point that “You couldn’t pull them away from it.” (Anderson 1984). The game was obviously very simple but much more dynamic than the rest of the exhibition, and naturally “Everybody stood in line to play.” (Lovece 1983:40). Creating a two player game, instead of programming an artificial intelligence to play with, was certainly an easier task, but at the same time, this mode was allowing multiple visitors to play simultaneously and interact with each other, leaving space for the rest of the non-players to stand and participate as an audience.

### 1.2 A SINGULAR EVOLUTION

During the golden era, video games started to grow in complexity, and having the computer as a counterpart became the norm. When game consoles started reaching the houses of players the standard number of players was set to two with some exceptions which were allowing four players either naturally or with the addition of special devices (commonly defined multi-tap). With the advent of Internet, the single players mode was emphasized to the point that “[d]espite the basis of playing, computer games are mostly played alone at the computer or players participate in on-line multiplayer gaming” (Strömberg *et al.* 2002:56). The idea of video game players as lone individuals became part of the social imaginary and defined as geeks and nerds. This shift towards on-line and non-physical communities (Volda and Greenberg 2009) is not exclusive to video games but to a wider area of social relations. Since the start of the social network era, many critiques have developed even from academics and professionals who traditionally promoted the use of innovative technologies, as Sherry Turkle did in her *Alone Together* (2012). Some researchers in game studies share the opinion of Turkle and highlight how the predominant presence of single-player games seems an anomaly:

The emphasis in the last few decades on single-player computer and video games is something of an anomaly in the eons-old history of gaming. While there are notable exceptions, such as solitaire card games, by and large over the centuries games have been valued as social experiences, as a way for people to relate to each other, as a way for people to *play* together. The fact that digital games are swinging back to favoring multiplayer experiences is not a new trend by any means: it is merely games returning to their roots as social play (Salen and Zimmerman 2004:462).

Of the same opinion Zagal *et al.* think that “a curious dichotomy exists in the nature of electronic games: the vast majority of electronic games are individual in nature whereas the non-electronic ones are collective by nature.” (2010:448). A comparison with board games is used by Costikyan to explain why “online games suck”:

**Long, long ago, in the depths of prehistory—that is, before *Pong*—games were a social activity. People got together to play Bridge or Poker or Monopoly or Dungeons & Dragons to chat and socialize and have a fun activity to do together. Even head-to-head games that require concentration and discourage table talk—like Chess or board wargames—were social, because you’d invite a friend to play with you, and the game was an excuse to get together. (Costikyan 1998)**

### 1.3 COLLOCATED MULTIPLAYER GAMING

The case of video games seems to be, among all the activities that people share, exemplar because playing is often an obvious reason for people to get together. For this reason, in contrast with the individualistic trend emphasized above, this investigation takes exclusively into account the so called non-network multiplayer games, or better, collocated multiplayer games. These will be observed through the lens of five factors: players’ population, characters’ relationships, control, controllers and the screens. The five factors are gathered from the literature and developed through observation. If we observe Tennis for Two through these factors, we can discover an interaction ecology of devices and humans, where a single shared-screen with multiple input controllers (1) makes two players to compete in rapid (almost simultaneous) turns and (2) defines an audience of non-players which transform gamers into performers themselves. The population involved in the game is composed by two players plus the audience. The characters relationships are competitive since

the players play directly against each other. The players' actions define a semi-real-time gameplay where both players can technically move simultaneously but their action is effective only in the presence of the ball. The two players have an independent controller. The game is visualized on a single screen where both of the characters are visible in a single frame without any separation other than the virtual net.

## 2 RELATED WORK

### 2.1 INTERACTION ECOLOGIES

Taking this initial observation into account, the interest here is to understand the social interactions emerging through five factors of the ecology defined by a video game. Analysing an interaction ecology is an operation of mapping all the relations among the individuals (both human and computational) involved in an environment (Savasta 2015). In general terms, we can say that ecology should not be read exclusively as related to the nature-environment movement but in a wider perspective:

Ecology in my sense questions the whole of subjectivity and capitalistic power formations, whose sweeping progress cannot be guaranteed to continue as it has for the past decade. (Guattari 2000:35)

Or as Bogost puts it from a media perspective:

Following the lead of media ecologists like McLuhan and Postman, media microecology seeks to reveal the impact of a medium's properties on society. But it does so through a more specialized, focused attention to a single medium, digging deep into one dark, unexplored corner of a media ecosystem, like an ecologist digs deep into the natural one. (Bogost 2011:7)

The five factors observed in the interaction ecology of collocated multiplayer games are what Bogost defines as the medium's properties. Observing the ecology, in this context, means to map the reciprocal actions of devices and people in the space of the game, and how these actions are allowed or limited structurally. Instead of focusing on the single game or the relation between an individual and a game we will analyse only cases of multiplayer games in which at least two players are involved.

### 2.2 SOCIAL RELATION MODELS

To understand the limits of this ecology, which is the space of the game, we must introduce the concept of *interaction membrane* or the *magic circle* as it has been described by Salen and Zimmerman (2004) and before by Huizinga (1949). The magic circle has already been compared by Montola (2009) to the interaction

membrane described by Goffman (1961). The space of the game is separated from the outside by the rules, acting as a membrane, keeps a degree of permeability. The interactions around the game membrane are divided into two levels by Salen and Zimmerman (2004) as *within* and *outside* the game membrane. The interactions within the game membrane are developed internally or rather inside the game which means that they are related to the rules of the game. The interactions outside are developed externally and include the relationships between people independently from the game itself. These characterizations reflect the posture of individuals toward each other in relation to the game. A similar classification is given by the earlier work of Zagal *et al.* (2000) in which they define two types of interactions: *natural* and *stimulated*. The stimulated interaction is what is necessary for the game to happen, the rules of the game define the need for a direct interaction. So, the stimulated interaction can be compared to the interaction within the game of Salen and Zimmerman (2004). The natural interaction is a spontaneous act parallel and independent from the game development, a chatting over the game. A specific analysis of the interactions independent from the game, seen through an activity theory perspective is offered by Ang *et al.* (2010). Two themes on extrinsic play are defined: “Around the game (discussion on and exchange of game experience)” and “[b]eyond the game (use of the game to play in a different way) and breaking the game (modification of the game)”. Ultimately, Zagal *et al.* define a case of multiplayer game *without interaction* and describes it as a case “in which artificial intelligence could replace the human opponent without the human noticing any difference.” (2000). Online games generally limit or deny outside interactions delegating the role of chat and discussion to specific external platforms (as thematic forums) which are used asynchronously, that is before or after the gameplay.

The aesthetic framework built by Hunicke *et al.* explores games through eight different elements of a taxonomy among which she describes the *fellowship* (2004). Fellowship as social framework in games is intended as a way of creating constrictions that force a collaborative approach. For example, by increasing the complexity of a task the help of a partner is required to reach a solution. This way of stimulating social interaction can be associated, due to the constrictions, to the within interaction of Salen as well as the stimulated type of Zagal.

In their work of games' classification, Elverdam and Aarseth present a wide spectrum of factors (2007). Two of these factors are of particular interest here: *player composition* and *player relation*. The player composition describes how the players are organized in the game (single player, single team, two player, two

team, multiplayer, multiteam). The player relation describes two dimensions: *bond* (dynamic, static) and *evaluation* (individual, team, both). Bond defines the relation between the players. This relation though can be static, in the case of a stable relation, or it can be dynamic, when it changes during the game. Evaluation defines how the performance of the players are measured. This dimension specifies the score system of the game: whether each character gains points for himself independently, or the points are gained by the team as one entity, or if the system calculates a combination of the two with points gained individually and by the team.

Stenros *et al.* (2009), using a similar scale as Elverdam and Aarseth (2007), structure a gradient of sociability in games as single player, two players, multiplayer, and massive multiplayer. This gradient of sociability includes very different elements such as: the possibility of creating gameplays as performances in which an audience is involved; or the possibility of recording a gameplay to create demos for publication or the construction of paratexts (e.g. machinima); the shared scoreboard which defines a competitive level among different players; and the shared gaming capital built by the cheat codes and the online support. All of these elements affect the sociability of the player even in single-mode games.

Stenros *et al.* divide the two players' mode into *collocated* and *remote*. The collocated game can unfold as *simultaneous* play, *hot-seat game* or *turn based*, and *sequential*; *networked* as in the case of LAN parties and *parallel* in the case of different games played in the same location. In a remote game, the player can join the game on the same server building *direct* (through characters) and *indirect* interaction (through the world), *back channel* (messaging, voice chat) and *voice over* (in-game or with specific software). Non-simultaneous and remote separated gaming are two more rare cases in video games.

The case of more than two players is treated by Stenros *et al.* focusing on players/character's relations. The gameplay can emerge as *competitive* (multilateral and unilateral), *collaborative* or *cooperative*, and can present a communication asymmetry (in the case of multiple collocated players with others remote players, or, as in the case of communication, through separate channels) and teaming up. With regard to massive multiplayer games, Stenros *et al.* investigate the phenomena of co-presence (the feel of playing and being together) the various degree of playing community (friends, micro, macro) and the neutral relationship (the other players become non-playing characters or audience). The brief review above creates the opportunity and the foundation for further investigation.

### 3 AN INTERACTION ECOLOGY PROPOSAL

Each of the frameworks and models presented analyses the interaction membrane defining different factors due to the specific focus and perspective of the authors. The framework proposed here tries to synthesize the factors found in the previous studies and, by adding an original contribution, covers the overall interaction membrane. In order to shape a more inclusive overall system we collected different perspectives under a single framework, and in doing so we consciously lost some depth over the single factors. What is left out is a set of parameters for the single player and the remote massive multiplayer since our declared focus is the collocated multiplayer game. Paratexts and increased sociability are also disregarded. What are included as factors are 1) the design of the interface—including the screen structure—and 2) the controllers offered to the player, since both of the elements can influence the social game and are not well investigated in the literature.

The factors proposed in the framework are: players' population, characters' relationships, control, controllers and screens. The selection of factors is made in an attempt to combine different frameworks without creating overlapping parameters. The chosen case studies offer an exemplification of various configurations of the framework which combine different factors (e.g. a competitive character relation with two or four players, different type and numbers of controllers independent from the number of players). An example that well explains how these factors can vary independently is given by Bogost:

In some asynchronous games, one player immediately follows another, in others a duration of time elapses between players. Play might take place on the same computer, console, or device, or it might take place on separate devices. (Bogost 2004:2)

The factors chosen are for these reasons independent and offer a wide variety of elements that are peculiar to the case studies examined, and a non-hierarchical organization of them allows us to combine them without creating confusion.

#### 3.1 PLAYERS' POPULATION

The players' population is an ordinal value describing the number of players involved in the game. This element alone ensures neither increased social gaming nor clarifies the relations that are established among them. "Just because a game is played by many people does not mean that social fun will emerge" (Stenros *et al.* 2009:86). It's also important to note that especially in the

case of collocation the presence of an audience is very common. This presence of non-players influences the gameplay and the social game. As noted at the beginning, the number of players is generally increasing to the power of two (two, four, eight and sixteen). A greater number than sixteen is verified almost exclusively in online games known as Massive Multiplayers Online Games (MMOGs).

### 3.2 CHARACTERS' RELATIONSHIPS

In literature, the relation between the players in the game are observed from different perspectives. What I believe is preferable is to talk about the relationships among characters or, it could be said, among the roles of the characters. In this respect I define five different modalities: cooperative, collaborative, subordinate, conjugate and competitive. Although these relationships are not always static in the game, in general it is possible to define how the behaviour suggested by the gameplay itself pushes the characters towards one or other posture. As Rogers vehemently highlights, it is possible to define a posture suggested by the game even if the players can blur the differences “[a]fter playing Gauntlet with my stupid friends, I realized even a cooperative game can easily dissolve into a competitive one.” (Rogers 2004:381).

**Cooperative** is the modality in which characters fight with a common aim and are rewarded equally or in interdependence with the others player characters. In the *Bubble Bobble* (1986) series the two dragon characters help each other. As in the similar *Snow Bros* (1990), in order to win the game, the characters have to climb up a series of platforms by killing the enemies in front of them. An interesting example of a cooperative relationship with different roles is *Wakeboarding Unleashed* (2003) where one player drives the boat and the other controls the rider. The cooperation of the characters is essential to win the game. An extreme case of collaboration can be identified in *We Love Katamari* (2005) where players control only half of the character imposing strict cooperation.

**Collaborative.** The collaborative modality is structured in such a way that the players temporarily combine their actions, sharing a common goal, but they still individually fight for the final aim in the game. This modality can be considered as a competitive mode with occasional associations. As Stenros *et al.* (2009) suggests, an example is *Counter Strike* (2000) which is a cooperative game where characters cannot harm each other, but in which the attitude of players can transform into competitive.

Similarly, in *LittleBigPlanet* (2008) players can freely play with decorative stickers gluing them on any possible surface, including the other characters. Brought to the extremes, if the players choose a character as a target, they can—by sticking on him large amounts of decorations—prevent him from seeing where he goes.

**Subordinate.** In some games the characters have different roles and an established hierarchy among themselves. One character can have the role of the leader and the other fellows' characters act as helpers. In *Super Mario Galaxy* (2007), for example, the first player controls Mario while the second controls a star which performs special moves and attacks. Similar cases in which support characters help the protagonists are *DeathSpank* (2010) featuring DeathSpank and Sparkles the Wizard, or *Child of Light* (2014) with Aurora and her little firefly Igniculus.

**Conjugate** is a modality in which the players aim at different goals in the same gameplay. The agenda and motivations here are separate (Rogers 2004). At this stage of the research we could not encounter any examples applying this modality in collocated games, but the conjugate relationship is used commonly in massive multiplayer online games as for example in *World of Warcraft* (2004). It is probably understandable why this modality can be at least unpopular in collocated games considering that if the goals of the players are completely different and the actions totally independent even if the part of the same gameplay it may feel like the characters belong to different gameplays.

**Competitive** is the modality in which the characters face each other. The defeat of one character means the victory of the other, or, in a more general case, in order to win, a character has to defeat all the others. This mode applies to most of fighting games from *Heavyweight Champ* (1978) to *Street Fighter* (1987), to the epic, up to eight simultaneous fighters, *Super Smash Bros* (1999).

**Team competitive** is a modality in which teams try to defeat other teams. It's a mix of cooperation and competition in which the posture changes regarding the relational roles among characters (cooperate if team members or compete if members of opposing teams). The great classic double match of tennis is an example applied electronically in *Wii Sports Tennis* (2006). A more peculiar example is *Tetris Ultimate* (2014), a recent edition of the classic game featuring different multiplayers' modalities among which is the *team competitive*. In this mode the game is divided into two fields, one per team, and each of these fields is divided again in three columns, two columns are accessible exclusively by one of the players and a smaller column in the middle is shared among the partners-players. This mode forces the players to keep a mix of competition and cooperation in pairs.

### 3.3 CONTROL

How do players act in the gameplay? Are their actions free at any time? Can they act only at specific moments? These are the questions that the gameplay control factor tries to answer. Control is a time related factor different from the *temporal frame* defined in Zagal and Mateas (2007) which regards explicitly the role of time within and outside the game, or from the *time span* studied in relation to the players' attention by Cardoso and Carvalhais (2014).

**Alternate Turns.** The turn is alternate when a player has no control of his character while the other player is acting on her own. The time defines when a player can act, giving in some case control over marginal aspects of the game which do not lead to the win of the game itself, for example changing the position of the camera. *Worms* (1995) is a typical example of turn based games.

**Semi-Simultaneous.** An action is semi-simultaneous if a player can act on his character but his actions are irrelevant or preparatory. *Pong* can be included in this category because the action taken by a paddle while the ball is in the other half of the field are relevant only during the receiving phase. A game like *Neon Battle* (2015), being a remix of *Pong*, adds a more simultaneous interaction by transforming the field into a circular one, in which the paddles can also touch each other.

**Simultaneous.** The action is simultaneous if the players can always control their characters acting directly in the gameplay. Among the titles already mentioned that fit this mode are: *Super Mario Galaxy*, *Wii Sports Tennis*, *LittleBigPlanet*, *Bubble Bobble* and many others. This is somehow the favourite modality for designers which prefer all the players to act and be part of the game at the same time. It seems when possible an obvious choice for a greater involvement of the players into the game although the other modalities can guide towards valid alternatives.

### 3.4 CONTROLLERS

The device which allows input to the game is crucial to define the relations among players and characters. It is somehow connected to the *control* factor and it can influence it.

**Independent.** The controller can be independent: namely each of the players has his own controller to interact with his own character. In most of the cases each player holds their own controller as in *Pong*, *Metal Slug* (1996) or *Super Smash Bros*.

**Provisional.** In other cases, the controller can be just one. The players need to pass it around while playing. Therefore the device is provisional. In *Worms* the players use, or can use, the same controller for their own turn to apply the strategies for vic-

tory. Another way of applying provisional controllers is established by the players independently from the modes offered in the game. In order to reach the end of long games players can decide to play in alternating turns. Especially in the cases without possibility of saving as for example *Flink* (1994), *Super Mario Bros 3* (1988) and *Fatal Labyrinth* (1990) this practice becomes a useful resource. Another possibility is that of impersonating every character in the game instead of just the teams in the baseball of the *Wii Sports* (2006) transforming a two players' mode into a two teams match. In these cases many modalities (one life per player or one level per player) can be informally established by the players transforming even single player games into multi-player experiences.

**Shared.** The controllers can also be organized so that multiple players can act simultaneously on the same device. This modality is again often generated by the players more so than planned by the designers. In the case of *Street Fighter* (or any other fighting game) a player can move while the other is kicking and punching using the same controller. One example of a designed shared controller is *Collabolla* (2004) a *Pac-man* (1980) edition played with fitness balls. The fitness ball is used for hitting the ground in different locations corresponding to forward and backward for one player and left and right for the other. This original controller can be seen as a scaled up version of the dance platforms used with PlayStation or arcade games.

**Divided.** In games such as *Super Mario Galaxy* or *We Love Katamari* the players control the same characters with multiple controllers. In *Super Mario Galaxy* the second player, the star, can make Mario jump or increase his jumping ability by coordinating the movement with the other player. In the cooperative mode of *We Love Katamari* the division of the control is more symmetrical allowing each player to control half of the character.

### 3.5 SCREENS

The spatial organization of the output is the physical property which conditions the players to focus on a certain space of vision.

**Single** screen means that a single display shows a single frame in which all the characters act together. It can happen that some active characters leave the screen during the game but in this case all the players lose sight of the character, including the player who is controlling it. This happens in games such as *Mortal Kombat* (1992) where one character can disappear and reappear on the screen or *Battletoads* (1991) and *Micro Machines 2: Turbo Tournament* (1994) in which leaving the screen means losing a life or all the game. In many other cases characters are all just forced to stay in the same screen as in roleplaying games such

as *Diablo III: Reaper Of Souls* (2014) or beat ‘em up games like *Double Dragon* (1987).

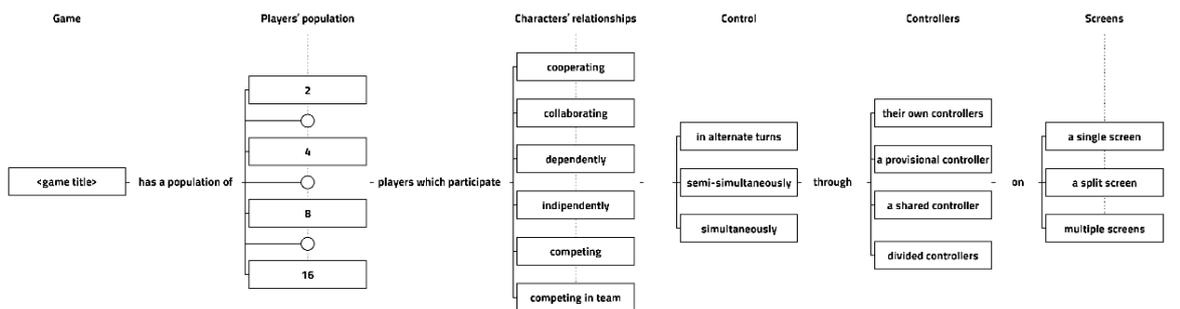
**Split.** The split screen is a classic solution offered to give freedom of exploration to all the characters using a single physical display. The display is thus framed in multiple divisions generally dedicating one area per player. Size and resolution of the screen are two technical problems that can emerge influencing the gameplay. Dividing the screen to provide multiple cameras is a classic modality of racing games, among them, *Mario Kart 64* (1996) that divides the display into four screens for a four multi-player mode.

**Multiple** screens is the case in which the game is distributed on different separate displays. This is a modality that can solve the problems of the previous mode, and can also offer an enhanced mobility in the case of displays on mobile devices. Sanneblad and Holmquist (2004) describe *shared displays* referring to contents which are distributed among multiple devices. I believe the term multiple better fits the definition in this context, and does not create conflict with the other properties defined here (a single screen among players is in fact shared). In many Gameboy multiplayer games, such as *Gauntlet II* (1991), it is possible to connect multiple devices to play together on separate displays.

### 3.6 FRAMEWORK

In conclusion it is possible to suggest a possible framework for an ecological analysis in collocated multiplayer video games. This diagram (Fig. 1) gives an overview of the five factors and their modalities, and acts as a summary and a guide for further studies.

**Fig. 1.** Framework for an ecological analysis of social relation in collocated video games.



As game changes I consider the ones that already defy the rules

defined by the factors. The list presented is non-exhaustive but serves as a guide for the analysis and application of the framework. In the case of single player games I omitted the characters' relationships factor since there are no multiple characters controlled by players.

**Table 1.** Table of applied ecological analysis of social relation in collocated video games.

Year	Title	Players' population	Characters' relationships	Control	Controllers	Screens
1991	Battletoads	4	collaborative	simultaneous	independent	single
1986	Bubble Bobble	2	collaborative	simultaneous	independent	single
2014	Child of Light	2	subordinate	simultaneous	independent	single
2004	Collabolla	2	collaborative	simultaneous	shared	single
2000	Counter Strike	2	cooperative	simultaneous	independent	single
2010	DeathSpank	2	subordinate	simultaneous	independent	single
2014	Diablo III: Reaper Of Souls	4	cooperative	simultaneous	independent	single
1987	Double Dragon	2	cooperative	simultaneous	independent	single
1974	Elimination	4	competitive	simultaneous	independent	single
1974	Fatal Labyrinth	1	-	alternate turns	provisional	single
1994	Flink	1	-	alternate turns	provisional	single
1985	Gauntlet	4	collaborative	simultaneous	independent	single
1991	Gauntlet II	4	collaborative	simultaneous	independent	multiple
1978	Heavyweight Champ	2	competitive	simultaneous	independent	single
2008	LittleBigPlanet	4	cooperative	simultaneous	independent	single
1996	Mario Kart 64	4	competitive	simultaneous	independent	split
1996	Metal Slug	2	collaborative	simultaneous	independent	single
1994	Micro Machines 2	8	competitive	simultaneous	independent/ shared	single
1992	Mortal Kombat	2	competitive	simultaneous	independent	single
2015	Neon Battle	2	competitive	simultaneous	independent	single
1980	Pac-man	1	-	alternate turns	provisional	single
1972	Pong	2	competitive	semi-simultaneous	independent	single
1990	Snow Bros	2	collaborative	simultaneous	independent	single

1962	Spacewar!	2	competitive	simultaneous	independent	single
1987	Street Fighter	2	competitive	simultaneous	independent	single
1988	Super Mario Bros 3	2	collaborative	simultaneous / alternate turns	independent/ provisional	single
2007	Super Mario Galaxy	2	subordinate	simultaneous	independent/ shared	single
1999	Super Smash Bros	8	competitive	simultaneous	independent	single
1958	Tennis for two	2	competitive	semi-simultaneous	independent	single
2014	Tetris Ultimate	10	team competitive	simultaneous	independent	split
2005	Wakeboarding Unleashed	2	cooperative	simultaneous	independent	single
2005	We Love Katamari	2	collaborative/competitive	simultaneous	independent/ shared	split
2006	Wii Sports/Tennis	4	team competitive	simultaneous	independent	single
2004	World of Warcraft	N	conjugate	simultaneous	independent	multiple
1995	Worms	2	competitive	alternate turns	provisional	single

## 4 CONCLUSIONS AND FUTURE STUDIES

This research introduced five dimensions for the ecological analysis of collocated multiplayer video games. The five factors defined (players' population, characters relationships, control, controllers and screens) are gathered from previous literature and observation. The attempt is to clarify the ecological context of game and gameplay in the physical space. In order to experiment and start understanding these potentialities a design application is presented as a conclusion of the study. The aim of this final output is to challenge the described factors and build a base for future discussions and studies.

Following the idea of speculative design as a way “to debate potential ethical, cultural, social, and political implications” (Dunne and Raby 2013:47) an extension of the research conducted is shaped as a design proposal. The output of the research is thus shaped in the form of a video game, an experimental variation of Atari *Pong*. *WiPong* is an extended multiplayer version of *Pong* with a virtually infinite number of players, competing semi-simultaneously through their own controllers on multiple screens. The idea of extended multiplaying applied to local gaming is in clear contrast with the MMOGs trend. The game field, as in the classic game, is divided in two parts one for each paddle-player; in *WiPong* each player can see only his own half of the field increasing the difficulty of the game (the player is not able to see where the ball comes from before it enters its field). The players compete with each other in a limited physical space

defined by the virtual walls of WiFi a limitation imposed by the system which becomes a feature of the game. The project challenges the maximum population of players and the simultaneity of the game, applying the contemporary technique of the bring-your-own-device.

This study can be followed by tests and observation of the different social patterns emerging from the combination of the different factors. A study using the same games analysed empirically here or with further specifically developed games such as *WiPong* can reveal more aspects and define effects on social behaviour. "If the social history of video games can teach us anything, it is that humans will use games to connect with each other" (Williams 2005:18). As designers and researchers we need to understand how to better drive the potentiality of contemporary tools to improve this hunt for the old fashioned sociality of physical spaces.

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