

Nonverbal communication in multiplayer game worlds

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ABSTRACT

In this paper, methods for nonverbal communication in digital games and virtual worlds are explored as alternatives to chat and other text-based forms of communication. Inspired by pre-linguistic societies and pictographic languages, the design of a new system called 'symbolchat' for virtual worlds is described. An online game is developed that uses this system at various levels in the game world. Reflecting upon the design and development of this system, and observation of it in use by players the application and role of nonverbal communication in digital games and virtual worlds is explored.

Categories and Subject Descriptors

J.5 [Arts and Humanities]: Player communication in virtual worlds – *interaction design, Graphic User Interface, game design, digital media language.*

General Terms

Experimentation, Languages

Keywords

digital games, MMOGs, iconography, visual communication, post-linguistic, interaction design, gameplay, digital media language, nonverbal communication.

1. INTRODUCTION

Nonverbal communication [5, 10, 26, 27] is characterised by an immediacy, intimacy, impact, stillness and depth of meaning expressed through action, gesture and symbol. Within digital media this communication occurs via a hybrid language that blends film, graphic design, visual arts, theatre, architecture and other creative disciplines. Over the previous century visual languages have come to dominate many forms of communication, particularly digital media, and a significant level of visual literacy [28] has developed as result. By way of example, the ubiquitous computer icon [11] has evolved from the static form typical of the visual communication strategies of graphic design to a hybridised, dynamic, animated form within digital representation. A detailed analysis of the particulars of nonverbal and iconic communication is beyond the scope of this paper that instead focuses on the design and implementation of a prototype for these modes of communication within virtual worlds.

1.1 Player-to-player communication

Due to the social nature of most virtual worlds, player-to-player communication may be seen as equally important as the systems

(game mechanics, administrative, technical) used to govern and maintain the persistent world as this communication shapes the players identity and the character of the world itself. Multiplayer games and virtual worlds, such as *World of Warcraft* [31] and *Second Life* [22], typically use a combination of in-game chat, avatar animation or 'emotes', avatar appearance and direct action for player-to-player communication. However, this communication is usually mediated by a chat window superimposed on top of the virtual world. Players work around this limitation by filling the chat window with acronyms and emoticons to expedite communication when time is short.

Within these game worlds, hybrid forms of communication begin to emerge. Typically, nonverbal communication [26] refers to the communication via wordless messages such as gesture, body language, facial expression, intonation of speech, clothing, infographics and so on. In virtual worlds this mode of communication is typically stylized through the animation, appearance and performance of the player's avatar. Likewise digital pictographs, symbols and icons [25] operate under different constraints than their pre-digital counterparts. In addition to the capacity for animation and sound, digital icons may alter their appearance dependent on context, be embedded within the space of virtual worlds, react to input and interaction, and be created, combined and modified quickly and easily.

Within digital games and virtual worlds there are multiple levels of communication occurring simultaneously crossing over a number of different modes. This includes player-to-player communication, the meaning that can be read from the space itself, the actions of bots or intelligent objects, the Graphic User Interface, and the game world's responses to interaction. This paper argues for a hybrid form of communication that is designed specifically for player-to-player communications that blends aspects of these various modes. It not proposed as a replacement or equivalent for written languages, but as an alternative that is better adapted to the particular needs of communication within digital games and virtual worlds that takes advantage of some of the unique aspects of these places.

Eliminating all those words and chatter we may explore more poetic modes of communication possible within virtual worlds via nonverbal language and in turn explore the expressive potential of digital media. Through the quiet intensity of nonverbal communication the stillness of digitally mediated social interaction may be experienced without the 'noise' of chat. In this paper, four main levels of nonverbal communication are identified: (i) chat using graphic symbols and abbreviations; (ii) players actions and gestures in world; (iii) players creations or modifications in the world; and (iv) meaning implied in the

players history or past actions. It is primarily the first two levels of communication that are explored in this paper.

1.2 An experimental game world

This paper examines a multiplayer game environment that was constructed to test and explore these themes. The game requires two teams of five players to find and collect objects distributed throughout a virtual world. In each team the players must collaborate to achieve this goal before the other team. Player-to-player communication occurs locally through performative animation and globally through a chat window that consists exclusively of an iconic, abbreviated form of communication. This iconic language also appears on the game map, user interface and within the game environment itself so that it is learned through being in the space. The game draws upon a range of influences such as Blissymbolics [3], digital media art and virtual world design [2].

Through an analysis of player communication and behaviour within this game experiment, the nature of digitally mediated nonverbal communication is explored. Its role as an alternative or supplement to existing modes of player-to-player communication is examined with particular attention to its aesthetic qualities, efficiency and emotive impact. This paper describes the development and use of a pictographic chat system called symbolchat integrated within a multiplayer game environment designed to explore these themes. This is informed by communication systems using icons and pictographs in current virtual worlds and digital games [24]. These forms of communication have evolved from a long history ranging from the various developments and innovations within the field of graphic design during the last century, and the languages developed in pre-linguistic societies [17] such as Egyptian hieroglyphs and Mayan glyphs. A number of examples may also be identified within existing works and projects.

1.3 Icons and pictographs in digital media

In *Iconica* [12] an iconographic language defines an artificial world made of language and is used for internal communication within the system running the world; for representation of its spaces, entities and forms; and by the players in order to communicate with its artificial life. Another work, entitled *Semimorph* [13], maps a similar language to four different modes of representation: word, diagram, icon and simulation, in order to describe a series of game worlds.

A standard feature of the Nintendo DS gaming system is *Pictochat* [20], a visual form of chat that uses the systems wireless networking to establish ad-hoc communication between multiple players. Using the touch screen of the Nintendo DS in combination with a set of existing icons, players may draw messages and send them to one another. Within the popular game, *The Sims* [30], the emotional state or activity of many of the simulated people is displayed using a set of graphic symbols. Likewise, within *Animal Crossing* [1] a similar visual code exists allowing younger players who cannot read the text an understanding of the relationships between the characters and their world. The forthcoming science-fiction themed MMO, *Tabula Rasa* [29], uses a language of graphic symbols to author new abilities that may be used in game.

An augmentation to the raid systems in *World of Warcraft* (WoW) [31] allows players to place basic symbols (a star, a crescent, a

skull and so on) above specific targets in order to coordinate the activities of up to forty online players in combat with multiple targets. The players then decide what these symbols mean – attack those targets with a skull, divert those with a star and so on. Within this type of game environment, and virtual worlds such as *Second Life* [22] one of the main activities is social interaction which occurs predominately through in-game chat. Much like other forms of online chat and text-based communications such as email, this is augmented via the use of emoticons [9] and kaomoji [16] that consist of small combinations of characters that describe moods and actions, such as happy and sad, a wink or laughter. These provide an emotion or attitude to that which is being said via text within online chat. These have also become common in mobile phone messaging and many have been formalised via inclusion within drop down menus in instant messaging and other chat software.

1.4 A brief history of pictograms

During the past century, a number of pictographic languages were developed for public information systems. These largely evolved from Neurath's Isotype [19], a system for simple communication using a base set of pictographs that could be combined to create more complex messages. In a similar way, Blissymbolics [3] establishes a basic dictionary of about 3,000 symbols that may be placed together to create short statements and questions. Both systems were developed to allow non-linguistic communication of information that may be shared across cultures and societies that speak different languages.

These have been formalised in various ways. A standard set of pictograms was defined in the international standard ISO 7001: Public Information Symbols [15]. This set is most common in airports all around the world. In 1979, the United States Department of Transportation (DOT) [7] established a set of fifty pictograms based on those already in use for their national network of highways and roads. Pictogram [21], a Swedish company, publishes software for the development of systems of ideograms to allow an alternative method of communication for people with a limited ability to speak, read, and write. This system is used by edbydesign, a Melbourne based company that develops software for students with special needs. [8] Another company (also in Melbourne) markets a similar system called COMPIC that uses pictographs as an 'augmentative communication system'. [6]

1.5 Summary

Some of these systems, such as Mayan glyphs, DOT pictograms and emoticons, have emerged through a need for communication and have evolved via their use. Others, such as Blissymbolics and Isotype, have been constructed as complete languages and presented as a tool for adaptation to various applications. Some systems exist to augment other system of communication such as the raid system in *WoW*, language of *Tabula Rasa* and graphic symbols within *The Sims*. In all cases pictographic languages are used to make communication more efficient and effective, provide context that cannot easily be expressed in words alone, or to allow communication that crosses over speakers of a variety of languages.

2. NONVERBAL COMMUNICATION

Virtual worlds and online gaming began as largely text-based systems. In his comprehensive overview of both the history and design of virtual worlds, Bartle [2] draws heavily on the design principles of many early virtual worlds such as MUDs and MOOs. Many contemporary virtual worlds and online games are situated in simulated three-dimensional spaces with elaborate GUIs overlaid on a third-person view of the game world. In some cases this is simply an illustration of the same structure that can be found in text-only game worlds and as a result the interaction is also very similar. In others, the interaction is situated more within the space of the world and these make better use of direct interaction with the graphical representation of the gameplay. In most cases, however communication channels such as chat are overlaid on top of the space and are not well integrated within the simulation of the world itself. In addition to this, running a chat application in parallel to interaction with the game world places some limitations on communication within the virtual world.

So, despite the long history and rich use of text in virtual worlds and online gaming, a number of problems may be identified:

- it can take a long time for players to type text into the chat window, even using the various abbreviations that have been adopted as standard practice in online chat;
- the chat window is often not well integrated into game environment and so it breaks immersion in that it is not perceived as part of the world, but another layer on top of the main action (or it can become the main action);
- online chat as the main form of communication creates English language dominated worlds;
- more subtly, it can privilege or emphasise certain points-of-view in that the world becomes dominated by a conversation that is separate to itself and in some ways is at odds with the nature of the simulation;
- emphasis on text-based communication, while practical, bypasses the potential of other more abstract process based interaction that present a new opportunity for communication in virtual worlds.

Some of these issues are addressed by the use of in-game Voice over IP as the primary means of communication. It is immediate and does not interfere with the operation of the keyboard for navigation and in-world actions. It may carry some emotive or contextual information through the player's expression or tone. However, there are some issues that it does not address. It does not allow speakers of different languages to communicate with one another or the development of shorthand codes (unless the speakers talk in code or acronyms). Strangely enough, it can seem unnatural or peculiar in that it breaks immersion. A virtual world that has been carefully crafted to create the illusion of another space or time can be easily broken when the voices of the players do not fit their characters or appear out of context. On another level, systems of graphic symbols are more easily embedded into a virtual world as they can be attached to objects in game becoming in equal parts an extension of the GUI, asynchronous player-to-player communication system, and a mapping system.

By moving away from text-based communication other aspects of virtual worlds and digital games may be explored in terms of interface design, social networking, world-building and visual design. First of all, alternate modes of player-to-player

communication may emerge that allow better coordination of strategy, insight into another way of thinking or logic, or simply a different aesthetic experience. By testing these modes of communication in a 'live' environment with real players and real events, we can undertake the research of new languages in action rather than purely in theory. The community of a virtual world is the ideal context for the ongoing development and nurturing of an alternative language as the world provides a place for the language to manifest, exist and have meaning. This may be an international community due to the ease of connection to online worlds from any location in the world, but more so because a visual language allows access from players with any linguistic background. Virtual worlds to date have largely been restricted to speakers of a certain language, with some games published in multiple languages such as English, Chinese and Korean to counter this limitation. A shared pictographic language allows a virtual world to be accessed by speakers of any language and may allow communication between various online communities previously separated by linguistic borders.

Aside from these practical issues, there exist a number of other important aspects to alternative modes of player-to-player communication. Nonverbal communication and pre-cognitive perception of body language and other visual cues both play an important role in the richness of exchange that occurs in real life interactions. In addition to enhancing online communication, this may lead to other types of experience linked to the process of being coupled with an artificial world. By way of example, Lanier introduced the idea of 'post-symbolic' communication [4] to describe the potential of communicating without any form of symbolic representation altogether and simply shaping the form of the virtual world for a primal, direct form of communication. Moving away from text-based communication may also draw the line between narrative based gameplay (narratology) and that based on the process of interaction (ludology) more clearly. By interacting directly with the symbols of the game world and speaking through these, the player is not narrating their experience via chat but rather directly enacting their thoughts and feelings.

In order to explore alternative methods of communication in virtual worlds, this project constructs a multi-user interactive environment in which communication can occur without the use of spoken or written words (verbal communication). It became necessary to build a world to test this idea as existing systems, such as Nintendo DS PictoChat, are not implemented as virtual worlds and therefore limit the degree to which experiments with situated nonverbal communication can take place. Likewise, embedding an alternative system of communication into existing virtual worlds also proved difficult. This is due to the degree of modification required and their culture which is dominated by chat-based socialization. Using the environment created for this project, studies of human interaction may take place that examine the use of alternative, iconographic means of communication in order to evaluate its patterns of use and potential further applications. The project aims to:

- study new methods of communication within existing digital game environments;
- compare these to a broader range of alternative methods of communication (eg. iconographic language and other nonverbal codes);

- specify and articulate a mode of communication without words;
- develop a software application that enables multiple users to participate in conversation using this new mode of communication;
- analyse the results of user interaction in order to evaluate the effectiveness of the proposed language.

This may lead to a comparison of text-based forms of communication with alternative forms such as the symbolchat used in this research. While many existing forms of pictographic and iconographic communication have been developed, few of these have been designed specifically for virtual worlds and its endemic properties and unique characteristics. As it is a sophisticated form of hybridised media comprising a number of different audiovisual forms, it follows that a language comprised of this form may be an effective means of expression and communication. In this sense, it follows from earlier work that explores the ‘language of computers’ [11] and the opportunities that this presents for artists and designers of digital media.

In a broader context, this project is part of an investigation of nonverbal player-to-player communication in virtual worlds and digital games that asks the following questions:

1. What current trends exist relating to visual communication in digital games?
2. How do players communicate with one another in networked or shared environments such as MMOGs and other multiplayer games using methods other than text based communication such as chat?
3. What existing models of iconic / symbolic / visual communication may be applied to digital game environments?
4. Are there connections or convergence between the popularity of MMOGs (people projecting themselves into online worlds) and the proliferation of mobile devices (people being online in the real world)?
5. Why do people find these virtual worlds and wireless network spaces so compelling and engaging?

While the work discussed here broadly addresses all of these areas, it is primarily the second and third questions that are specifically explored in this paper as it presents one possible system for nonverbal player-to-player communication. The first question on visual communication is also addressed specifically, but in the limited context of its use for player-to-player communication.

Investigating these research questions requires a practice-based approach, such as the making and testing of an online game. Other threads of this research have involved the exploration of pervasive gaming, artificial life, generative systems and computational semiotics. This is part of a larger body of work relating to the ‘language of computers’. [14]

3. THE GAME SYSTEM

To explore these themes, a digital game was designed and implemented [18, 23] that required team based coordination using a pictographic language of online chat – symbolchat. The game is played by two teams of five players. Each team must find and collect a certain number of objects from the environment within a

time limit. The first team to complete their collection of objects will win the game. This rules and environment are set up as follows:

1. World

The game world is a large expanse of snow-covered hills and mountains that may be navigated by running and by using jump-pads that allow rapid movement across the terrain. It is broken up into eight main zones that are identified on the minimap. Hidden within the game world are small clusters of objects that the players must collect and return to their base.

2. Players

Each player has a unique appearance and symbol within the symbolchat language. Players may navigate the world, and collect and hold a single object. They may throw their object to another player, or to their home base therefore adding it to the team’s inventory. Some players collect and throw the objects of the opposing team into difficult places making it harder for them to complete the game. The actions that each player may perform include: move, jump, collect object, throw object, send message to team symbolchat window, and label signpost with message.

3. Teams

There is a red and a blue team. Each team has their own symbolchat channel so that they may communicate wherever they are within the game world. The team members must work together to collect sixteen objects using a form of in-game chat based on pictographs to communicate with one another. Each team has a base in which they store their collected objects that also acts as a scoreboard displaying their progress in the game. The game starts with all players located at their respective bases.

4. Objects

As described above, these are located within the various zones of the map. There are eight different objects and these are represented in the symbolchat language as different shapes (circle, square, triangle and so on). Four of each type are assigned to each team. Some are located in easy to find locations or are close to the base, others require more work in terms of mapping and navigation.

5. Symbolchat

The zones of the game world, individual players, game objects, player actions, emotions, and team bases are all included in the symbolchat language. This is visible via the game GUI that allows players to chat with one another and label the game world using the language. It appears in four main contexts: the team symbolchat channel; within the game world in the form of labels and local communications; on the minimap; and in the game GUI itself. It refers to objects, actions, locations, and states that exist in the game world.

The game environment and interface is described below, with particular attention to the ways in which the pictographic language is embedded within the world, interaction with the world, and player-to-player communication.

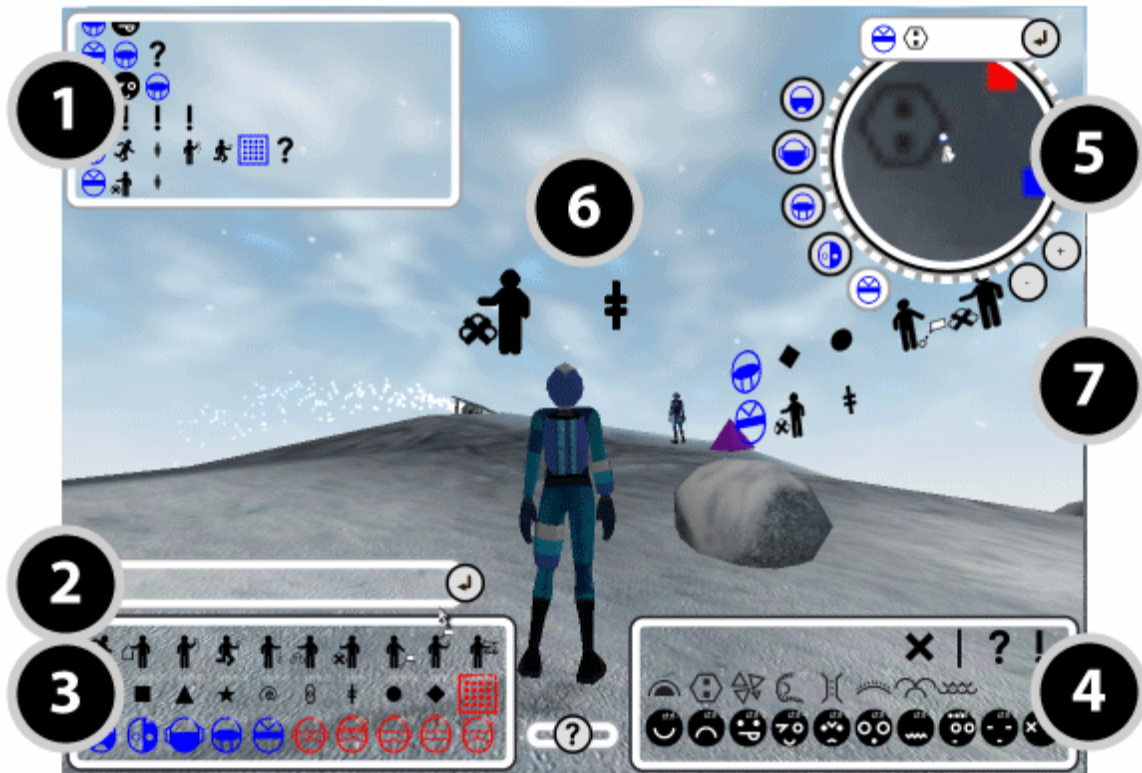


Figure 1. Screenshot of game environment including labelled symbolchat features.

3.1 Language

Each symbol is represented by a button in the game HUD, grouped into symbol panels (3 and 4). In addition each symbol has a keyboard shortcut indicated on the symbol button.

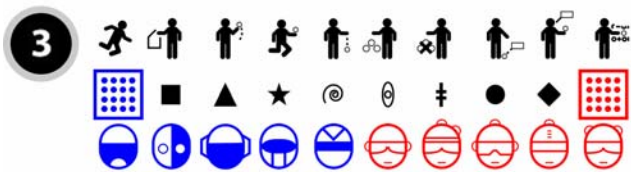


Figure 2. Symbol set: actions, items, players.

- actions: goto open pickup carry drop collect do_not_collect label identify decode
- items: bluebase cube pyramid star spiral seed double_cross ball diamond redbase
- players: blue1 blue2 blue3 blue4 blue5 red1 red2 red3 red4 red5



Figure 3. Symbol set: modifiers, locations, emotions.

- modifiers: negative divider question exclamation
- locations: caves base glacier crevasse bridge moguls lake
- emotions: happy unhappy joking wink angry surprised thinking confused tired dead

3.2 Chat in world

The player enters a string of symbols into the chat entry panel (2) by clicking buttons in the symbol panels (3 and 4) or by pressing their keyboard shortcut keys as indicated on the symbol panels.



Figure 4. Symbolchat entry field.

To send the symbol message the player either hits the 'enter' key, or clicks the 'enter' button (2a) on the chat entry panel.

The message is then cleared from the chat entry panel and is displayed above the avatar's head in the world (6).

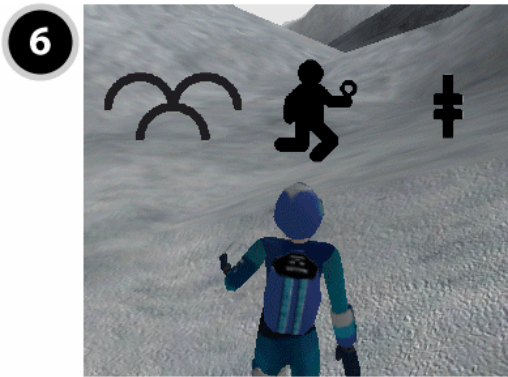


Figure 5. Symbolchat output in world.

3.3 Chat transcript

The chat transcript panel (1) keeps a log of all chat messages sent by the players in the order they are sent. Each message starts with the symbol of the sending player to identify whose message it is.



Figure 6. Log of symbolchat conversation.

In translation:

- blue1: blue2 question
- blue2: joking blue2
- blue2: exclamation exclamation exclamation
- blue2: goto double_cross pickup carry bluebase question
- blue1: do_not_collect double_cross

3.4 Embedding language in the world

Players can label items by selecting an item in the world and sending a chat message while the item remains selected. The label is attached to the item in much the same way as the chat transcript panel display messages, with the first symbol indicating whose sent the message. (7) Unlike the chat transcript panel only one message per player is displayed on the label.



Figure 7. Symbolchat attached to signpost in world.

3.5 Description of minimap functions and display

The minimap (5) displays a plan view of the environment surrounding the player. There are buttons to zoom the view in and out (5e).

At the top of the minimap (5b) is a convenient chat entry button which tracks the player's location, action and carried item (when there is one) and allows them to quickly send this message by clicking the 'enter' button. Figure (5b) displays the message 'blue1 base carry ball'.

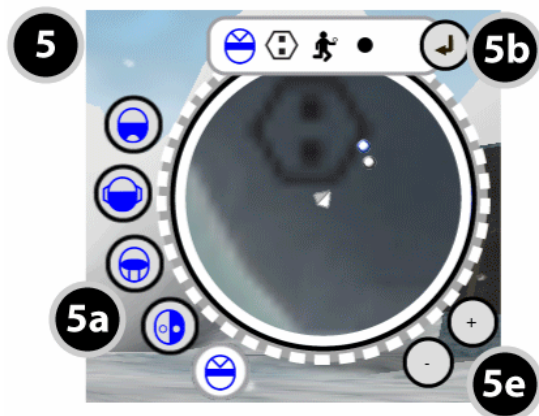


Figure 8. Minimap in GUI with features labelled.

The player is represented by an arrowhead in the centre of the map. Other players' locations are marked with blue or red icons according to their team (5c). Rolling the cursor over the icon displays the symbol of the associated player.



Figure 9. Locating a player on the minimap.

There are 5 radio button around the left edge of the minimap (5a). These filter the icons displayed per player. For example, to see the location of all the items labelled by blue5 the player would click on the blue5 button. Then any items in the local area would be marked on the map. Rolling the cursor over the icon reveals the label that blue5 has put on the item. (5d)

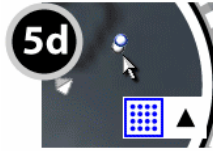


Figure 10. Location of labelled items on the minimap.

4. PLAY

At the time of writing, two different types of game testing have been undertaken. The first of these was a series of ten intensive play sessions of approximately one hour each with the same set of three players. These tests were conducted at different stages of completion so that the gameplay and language could be tweaked during development. This contributed mainly to features that allowed the language to be embedded in the game world using labels and mapping.

The second set of tests involved two sessions in which two complete teams of five players participated in competitive play with a time limit of thirty minutes. The players consisted of undergraduate students with varying degrees of digital game literacy ranging from expert to novice. In these sessions we focused on the uptake and use of the symbolchat language in conversation and strategy.

This second test was extended to include the development of an alternate game map by some of the students, and modifications to the sound and graphics to create another game altogether. This modification also introduced player cooperation in navigating the game map using a system of portals. This system required one player to activate a portal while another would use it. Instructions on the use of this system and the game rules were displayed within the game world using the symbolchat language.

Through these player tests, a number of different ways in which symbolchat is used by the players was observed. Some typical uses include strategy, conversation and navigation. Innovation in communication may be seen in the adaptation of the system and use of the animated performances built into the avatar. This section will look at each of these in turn.



Figure 11. Conversation in the game world.

4.1 Strategy

The primary use of the symbolchat system is to coordinate strategy within the player's team. There are pictograms for the basic set of actions, objects and places within the game world and these may be combined in many different ways. Messages may relate to the discovery and location of objects, roles within the team, updates on current score, optimal paths for navigation within the world and so on. The pictograms have been designed with these expressions in mind as they are the primary goals of the game. These may be constructed in several ways by connecting references to the player, to another player, a place or an object. For example, 'I collect object2 location3' or 'player 2 goto location4' or 'base object2 object2'

The communication of the opposing team may be read and it is not scrambled in any way. There is no prescribed use for the symbolchat system and so each team is free to develop a particular code to avoid reading by the opposing team. This typically emerges spontaneously during a game, although it may be planned earlier or evolves over several game sessions. While its use is not explicitly scored by the game, effective strategies for communication will allow completion of the game more quickly and efficiently resulting in a win for the team. In this way, effective communication is rewarded as part of the team's overall strategy to playing the game.

4.2 Conversation

The same type of conversation that occurs in chatrooms and social MMOs is not possible using the symbolchat system. An alternative, abbreviated form of social exchange becomes possible between players within the context of the game. Players speak via their actions in game and the characterisation of these actions through the system of emotes and personal style of symbolchat. As a result, there is little out-of-character conversation as the range of possible expressions is constrained by the game environment. The game goals need to be completed within a specific time limit and so socialisation is not really encouraged or accommodated by the game world. In a more social game world the symbolchat system could be extended to include a wider range of expression.

However, a significant amount of information about a player can be read from their behaviour and use of the game's pictograms. Simply watching another player will reveal aspects of their approach to spatial navigation and problem solving. Participation and use of symbolchat demonstrates aspects of their approach to communication – simple or complex, verbose or minimal, strategic or social, and so on. A personality emerges via each player's behaviour and communication without text-based communication.

4.3 Navigation

One of the primary goals of the game is to locate and retrieve objects required by each team's base of operations. These objects are strewn about the game world in various locations. Some are close by, others are far away. Some objects are easy to find, others not so. Successful navigation of the world is necessary to win the game. Symbolchat is integrated within the world and its navigation systems in three ways that assist the players in getting around the world.

First of all, there is the game map. This marks out the world using the same eight pictograms as those used in the symbolchat system. These pictograms relate to eight zones marked out within the world and the player's current zone is displayed at the top of the map. A route through the space may be described using a list of these zone pictograms. Secondly, players place messages on signpost objects within the space of the game world itself. This feature may be used to create a breadcrumb trail or to mark particular locations. Each message is marked with the player's pictographic tag so that they may be identified. This leads to the third feature, that is the display of these messages placed within the world on the game map. This means that other players do not need to be at the location itself to read and follow trails left by other players. The system allows for other ways of mapping and navigating the space to develop via player interaction with its navigation systems. Once again, this may provide a strategic advantage to the team.

4.4 Adaptation

As it is an open system, other uses for symbolchat emerge during play. There are a large number of new expressions that arise through the combination of the emoticons with objects, spaces and players. The player may describe their own mood, or their feelings towards the behaviour of another player or team. They may express their feelings towards actions, objects or spaces. Variations on the coded strategic language of a particular team may emerge to counter its decoding by the opposing team.

During play, a player or team of players may change the meaning of the pictograms. As the game system does not need to understand or parse the messages sent between players their use of the language need only be meaningful to them. That is, they are free to reinterpret and alter the meaning within the symbolchat system. Particular pictograms may acquire different meanings dependent on context. Familiar strings of pictograms may be reused and have different meanings depending on the switch of only one of the items in the string. Overall, the system is flexible in its use and interpretation as it does not impose a specific grammar and does not need to conform to a particular syntax within the game system.

4.5 Performance

In addition to the use of symbolchat the players perform various actions with their avatar. All of the basic actions in the world are accompanied by animation. These gestures expand the communicative possibilities of the player and give them more presence within the game world. Other forms of play emerge such as multiplayer writing to the same signpost or passing game objects around between players. Once again, these would be expanded in a more socially orientated virtual world to include the typical emotes such as laugh, dance, flirt and so on.

Some further actions emerge through play, such as the various combinations of jumping and running that can be used to get the attention of another player, indicate excitement and so on. Others combine actions with objects or locations with pictograms to create further levels of communication.

5. FURTHER WORK

In addition to the five modes of interaction observed during gameplay, some more general comments may be made on this experiment. First of all, the language of symbolchat as developed in this project presents a viable alternative or augmentation of existing text-based chat. While it limits communication to the specific areas represented within the language, players are inventive with developing new expressions from the basic set of pictograms, and this limitation encourages communication to objects and events that are specific to the world. Further development of the language may be guided by the five areas of strategy, conversation, navigation, adaptation and performance.

Allowing players to annotate and embed language within the world means that a second layer of GUI emerges through interaction. Icons appear in world as players move about the space and set up strategies of interaction and play. Rather than a fixed environment in which the players perception and understanding of the space is annotated within a separate chat window, this process of engaging with the space is integrated within the world and is directly associated with the topic of discussion. As noted earlier nonverbal communication is more dependent on context, and so it benefits by being directly situated within the game – much like the GUI itself. In this way, the language becomes the entire virtual world with game objects, artificial lifeforms, electronic spaces and player avatars all contributing to the construction of meaning. The player generated layer of symbolchat annotates and formalises this process thereby making it clearer to read and players less reliant on a separate channel of communication in the form of chat.

This paper has mainly focussed on the development and design of a digital game using alternative forms of player-to-player communication. Studies of its use are situated online via participation with the game itself. With this project now established, further research may focus on more formal studies focusing on larger populations of players and specific communities over an extended period of time. This is likely to be an interdisciplinary venture drawing upon additional areas of expertise.

Current work has shifted into the development of a persistent world that allows players to explore and play with a range of interactive musical-visual form. While the immediacy of game goals provides a suitable motivation for communication, the more long term interaction that is typical of online worlds is expected

to provide a better environment for ongoing development of the symbolchat language. This will be used for player-to-player communication in addition to player's interaction with and navigation of the world. Artificial lifeforms populate this space and these may be tamed and programmed using the language. The virtual world provides a place for the symbolchat language to reside.

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7. REFERENCES

- [1] Animal Crossing: <http://www.animal-crossing.com/> (25 Jul. 2007).
- [2] Bartle, Richard A. *Designing Virtual Worlds*. New Riders, 2003.
- [3] Bliss, C.K. *Semantography*. Sydney, Australia: Semantography, 1965.
- [4] Brockman, John ed. *What We Believe but Cannot Prove*. HarperCollins, NY, USA 2006, pp. 235-238
- [5] Burnett, Ron. *How Images Think*. MIT Press, 2004.
- [6] COMPIC: <http://www.ssovweb.com/compic/> (27 Sep. 2007).
- [7] DOT pictograms: <http://www.aiga.org/content.cfm/symbol-signs> (23 Jul. 2007).
- [8] edbydesign: <http://www.edbydesign.com/> (27 Sep. 2007).
- [9] Emoticons: <http://messenger.msn.com/Resource/Emoticons.aspx> (24 Jul. 2007).
- [10] Hocks, Mary E. & Michelle R. Kendrick (Eds) *Eloquent Images: Word and Image in the Age of New Media*. MIT Press, 2003.
- [11] Horton, William. *The Icon Book: Visual Symbols for Computer Systems and Documentation*. John Wiley & Sons, 1994.
- [12] Innocent, Troy. *The language of Iconica* in Dorin, A. & McCormack J. (eds) *First Iteration: A Conference on Generative Systems in the Electronic Arts*, CEMA, Melbourne, pp. 92-104.
- [13] Innocent, Troy. *Exploring the nature of electronic space through semiotic morphism*. MelbourneDAC, the 5th International Digital Arts and Culture Conference, May 19-23, 2003, pp. 72-80.
- [14] Innocent, Troy. *Shifting Realms*. Anastasiou et al (eds), in *Proceedings of Vital Signs: Creative Practice & New Media Now*, RMIT Publishing, Melbourne, Australia, pp. [4], 2005.
- [15] ISO 7001: Public Information Symbols: <http://www.iso.org/iso/en/CatalogueDetailPage.CatalogueDetail?CSNUMBER=13565> (23 Jul. 2007).
- [16] Kaomoji: <http://www.harapan.co.jp/english/japan/kaomoji.htm> (24 Jul. 2007).
- [17] Liungman, Carl G. *Dictionary of Symbols*. W. W. Norton & Company, 1994.
- [18] Meigs, Tom. *Ultimate Game Design: Building Game Worlds*. McGraw-Hill Osborne Media, 2003.
- [19] Neurath, Otto. *International picture language : a facsimile reprint of the (1936) English edition*. Department of Typography & Graphic Communication, University of Reading, 1980.
- [20] Pictochat: <http://en.wikipedia.org/wiki/PictoChat> (23 Jul. 2007).
- [21] Pictogram software: <http://www.pictogram.se/english/> (23 Jul. 2007).
- [22] Rymaszewski, Michael et al. *Second Life: The Official Guide*. Sybex, 2006.
- [23] Rollings, Andrew & Dave Morris. *Game Architecture and Design..* New Riders, 2003.
- [24] Salen, Katie and Eric Zimmerman. *Rules of Play: Games Design Fundamentals*. Cambridge: MIT Press, 2004.
- [25] Sebeok, Thomas A. *Signs: An Introduction to Semiotics*. University of Toronto Press 1994
- [26] Sebeok, Thomas A. *The sign & its masters*. University Press of America, 1979.
- [27] Stafford, Barbara Maria. *Echo Objects: The Cognitive Work of Images*. Chicago: University Of Chicago Press, 2007.
- [28] Stephens, Mitchell. *The Rise of the Image the Fall of the Word*. Oxford University Press, 1998.
- [29] Tabula Rasa: <http://www.playtr.com/index.html> (25 Jul. 2007).
- [30] The Sims: <http://thesims.ea.com/> (25 Jul. 2007).
- [31] World of Warcraft: <http://www.worldofwarcraft.com/> (25 Jul. 2007).