The Pataphysic Institute

Mirjam P. Eladhari
Gotland University
Visby, Sweden
mirjam.eladhari@hgo.se

Abstract

The Pataphysic Institute (PI) is a research prototype multiplayer game world. In PI, the personalities of the inhabitants are the base for the game mechanics. When interacting with other characters the potential emotional reactions depend upon avatars' current mood and personality. PI is built with inspiration from personality psychology and affect theory in an attempt to mimic possible emotional responses in order to give the player support in role-playing. The mental states of characters depend on their personalities and on their current moods. Moods differ according to context and to recent experiences. Emotional experiences become memories and define the relationships between characters. The mental state is the sum of the character and governs what actions can be performed in a given moment. In order to do certain things the characters need to be in certain moods - and for this the players need to game their avatars' emotions, and game their relationships.

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PI employs the Mind Module (MM), a semi-autonomous agent architecture for the 'mental physics' of the inhabitants. The MM consists of a spreading activation network with nodes of four types: traits, emotions, sentiments and moods. PI is built in Pixeltamer's framework for web based multiplayer games and is played in a web browser through a Java applet. The trait nodes define characters' personalities, and affect, through weighted relationships to the emotion nodes, how strongly individual characters 'feel' about events involving them. The emotion nodes' weightings to the two mood nodes, inner- and outer mood, summarise characters' states of mind in a mood-coordinate system as displayed in Figure 2. The sentiment nodes couple emotion nodes to entities in the game world, and are instantiated for characters as results of events that cause increased values in respective emotion nodes. The activity rate of the nodes diminishes with time, where the trait nodes are permanent; the emotion nodes diminish within minutes, but leave activity in the mood nodes which are active for hours. This results in that recent events affecting emotions 'stay' with the characters mood even when the context for the characters changes.

Players are introduced to the back story of PI before they log on, by reading the diary of Katherine, an investigator who was sent in to PI to investigate the consequences of a mysterious event called the Outbreak. In PI, reality has been replaced by the inhabitants interpretation of reality, and their mental states are manifested physically in the environment. The head of human resources at PI has taken upon himself the task of understanding the new and unknown world by applying personality theories. He forces everyone in PI to take personality tests[1], and studies what types of abilities these persons get, abilities he calls Mind Magic Spells. Another inhabitant in PI, Teresa, focuses on the finding that social interactions between people suddenly result in acutely concrete emotional reactions. She calls these Affective Actions (AAs), and tries to understand her changed environment by studying the patterns of these.

The basic game play is simple: players need to defeat physical manifestations of negative mental states. In order to do so, they can cast spells on them, but the spells available are constrained by avatars' personalities, current moods, and how far avatars have progressed in learning new abilities. Each avatar has mind energy (mana) and mind resistance (health points). Each spell costs mind energy to use, and attacks reduce mind resistance. The experience of the character defines how large the possible pool of energy and resistance is at a given moment. The regeneration rate of resistance depends on the inner mood, while the regeneration rate of the energy depends on the outer mood, as illustrated in Figure 1.

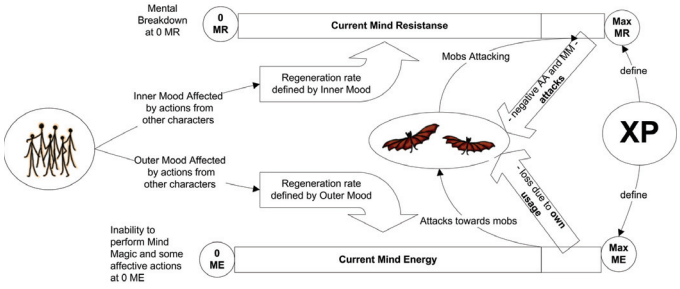

Figure 1: Regeneration of MR and ME.

Avatars can affect each other's moods by using AAs, thus controlling the selection of spells available. AAs are actively

[1]The IPIP NEO test consisting of 120 rating scale items is used for character creation (Johnson 2001).

chosen by the players, they are not effects of other social actions. If a player targets another avatar she can choose from a selection of AAs. For example the AA Comfort can be used successfully on targets that have an active emotion node of Sadness, but only if the player's own avatar is not in the area of Furious on the mood co-ordinate system. If the AA Comfort is used successfully the values of the emotion nodes Sadness and Anguish of the target are diminished, which in turn affects the mood of the character. When avatars exchange AAs with non-player characters (NPCs), the NPCs' choices of AAs are determined by their personality and current mood (implemented using behavior trees), and when applicable, the mood the NPCs 'want' to be in.

Display of Mind Module Values

In the screen shown in Figure 2 the MM information of the avatar Emil is displayed. In the top left column the values of Emil's personality trait nodes are displayed, and below that, his sentiments.

Figure 2: Display of MM information in the PI client

In the middle column the values of Emil's emotion nodes are displayed. The pink high-lighted dot next to the emotion Distress/Anguish signals that it is clickable. If Emil's player hovers the mouse over the dot the text 'Dull Pain' is displayed. This is Emil's first personality based emotion spell. If the player clicks the dot the spell is cast on a targeted entity, reducing Distress in that target. The column to the top right shows Emil's mood, displaying the value of the inner and outer mood nodes as well as the mood co-ordinate system. The white dot in the mood co-ordinate system shows which mood space Emil currently is in; Jubilant. The colored dots in the the mood co-ordinate system are clickable spells which affect the target's MR and ME, differently depending on the current mood. For example, characters in the depressed mood space may drain energy and resistance from opponents, while characters in the blissful mood state can give resistance to others. In the column to the lower right effects of recent actions are displayed. Emil has performed the AA Joke on the avatar Neurotica, who has responded with refusing to laugh. The number to the right tells for how long the effect of the action persists.

Entities

In PI there are entities of four types; Avatars, NPCs, Single Sentiment Manifestations (SSMs), and Compound Manifestations (CMs). All characters are equipped with MMs. The role of the NPCs are to, via dialogue and AAs, provide information and challenges to the players. SSMs and CMs are entities which can cast benevolent or harmful spells on avatars. CMs can also perform AAs. The entities in PI are instantiated in the world in different ways. NPCs are created by the world developers, and are in the world permanently. SSMs are also created by the game developers, but most of them are born as results of emotion nodes of other entities (avatars, NPCs and CMs) reaching their maximum value. As such, they are manifestations of the state of mind of the inhabitants of the world. For example, if an avatar 'feels' a Joy intensely the SSM Joy Jumbo is instantiated in proximity to the avatar.

CMs can be created by the developers of the world, but also by players. The players can author a CM if their avatar is affected by a sentiment curse or blessing, giving it a strong sentiment. Players can externalise the sentiment instantiated by curses or blessings of their avatars by creating CMs representing it, as such manifesting emotions of the avatar, authored by players. CMs become part of the world as threats or helpers to its inhabitants, in ways that can call for collective action taken by the avatars. Figure 3 shows a player authoring the manifestation Grieving Munchy, giving it custom dialogue text to exclaim when certain conditions are fulfilled, as shown in the middle-left of the window. The player also renames the spells the manifestation can cast (as shown to the middle right), and assigns which affective actions it will be able to perform (bottom left).

Figure 3: Window for creation of a CM.

In play-tests, described in (Eladhari and Mateas 2008) of the design underlying the PI prototype participants were able to form and communicate mental models of the MM and game mechanics, validating the design and giving valuable feedback. Despite constrained scenarios presented to test players, they discovered interesting, alternative strategies.

References

Eladhari, M. P., and Mateas, M. 2008. Semi-autonomous avatars in world of minds - a case study of ai-based game design. In *ACE '08*.

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