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The Human Avatar Project

2.1 Background on Related Work

This project calls together a variety of technological design domains, including psycholinguistic analysis, low-level artificial intelligence, Internet data mining, and interactive video. The experience fuses these domains without resting too heavily on the foundation of any single discipline.

2.2 Connotative Meanings in Language

As users of *Untitled Stream of Consciousness Project* place words into the avatar's head, they witness a particular causal relationship between the text and the expressions exhibited on the avatar's face. Specifically, the thoughts trigger new emotions or enhance existing ones. Hence, a significant aspect of the project involves associating a large number of words and phrases in the English language with certain emotional, or connotative, meanings. This task has typically fallen under the umbrella of psycholinguistic content analysis. A variety of programs, some web-based, have been programmed to procedurally scan user-entered text, evaluating the writing statistically on a number of semantic factors including the evocation of positive and negative feelings. Most often the programs make these assessments by looking up keywords and phrases in a database or dictionary and retrieving associated values that have been validated through research studies.

In ascribing universal connotative meaning to bits of language, emotional content remains the most elusive of all semantic factors because of technical complications like part of speech and context.

Charles Osgood's Semantic Differentials

In the 1950s, a psychologist named Charles Osgood devised a scale for plotting adjectives along a continuum called the semantic differential, or semantic space. Through a number of surveys, he evaluated the words according to three primary factors: Evaluation (how people rate it according to certain qualitative polarities such as 'good' and 'bad', or 'cold' and 'hot'), Power (how people rate it along the spectrum of 'strong' vs. 'weak'), and Activity (how they rate it along the spectrum of 'active' vs. 'passive') (Underwood, 2005). Osgood's work was the first to give statistical weight to connotative word meanings, but it was not able to ascertain the emotional content of positively or negatively valenced words.

A.N.E.W.

Affective Norms for English Words is the product of an ongoing study at the Center for the Study of Emotion and Attention (CSEA) at the University of Florida. Their published data evaluates a large number of English words (nouns and adjectives) along semantic lines similar to those of Osgood. The categories include positive or negative valence (with higher positive values denoting increasing Pleasure), Dominance, and Arousal. (Bradley, 1999) These kinds of ratings have become a gold standard in psychological research, but bear only a marginal relation to expressible emotions such as anger, sadness, fear, and joy.

The EMMI project

A pioneering linguistics researcher by the name of Wayne Chase overcame the technical obstacles in determining the emotional content of words and phrases. He spent several decades developing what he called the Emotional Meaning and Impact Analyst, a piece of software connected to a connotative/ emotional dictionary that was designed to analyze writing and deliver a detailed evaluation of its overall emotional impact on a societal level. (“History of Connotative Reference Technology”, 2007) Currently, Chase heads a Vancouver group that is dedicated to developing a whole series of connotative reference tools for creative writers, speechmakers, and other types of users, including connotative equivalents of a dictionary, thesaurus, name giver, connotation checker, and others. (“Connotative Reference Corporation”, 2007) These references remarkably catalog emotional connotations for just about every word and phrase in the English language, including slang expression and basic verbs that seem quite neutral. (“Connotative Reference Corporation”, 2007) Unfortunately, none of the tools will be commercially available for at least a couple of years.

L.I.W.C.

The Linguistics Information and Word Count, a text analysis software program designed by James W. Pennebaker, Roger J. Booth, and Martha E. Francis, evaluates keywords along a number of dimensions, one being psychological affect. (“LIWC”, 2007) Factors include positive feelings, optimism and energy, anxiety/ fear, anger and sadness/ depression. The downside to this program is that by default, it only designates 615 words as being positively or negatively inflected and hence fails to detect affect in some cases. However, a major selling point is that it

enables developers and analysts to supplement and shape the data to their liking by creating a customized dictionary suitable to their own needs.

2.3 Emergence and Artificial Intelligence

In his book Emergence, Stephen Johnson distills some basic principles about “intelligent”, self-organizing systems out of scientific observations on the behavior of ant colonies and historical data on the development of cities. According to Johnson, “the movement from low-level rules to higher-level sophistication is what we call emergence.” (Johnson, 18) With proper feedback and control, some very discernable and often unpredictable macro-patterns can grow out of uncoordinated local agents following their own simple set of rules. (Johnson, 40) Emergence is the key to simulating intelligence in a computer program.

The Apartment

“Apartment”, designed by Marek Walczak and Martin Wattenberg, is a unique web-based application that, like *Untitled Stream of Consciousness Project*, analyzes user input in the form of text and creates a larger significant whole out of the individual semantic associations of different words. (Walczak, 2002) The playful experience invites users to freely type a line of text at a command prompt and then watch as individual keywords float into the floor plan of an apartment, occupying and expanding a particular room with which the word is universally associated. For instance, if the user types “I’m hungry”, both of these words move into the kitchen and increase its size in relation to all of the other rooms. Words such as “sleep”, “dream”, or “sex” make the bedroom larger. Over time, the layout of the apartment becomes a

meaningful picture of many users' subjective mental states. Users can view, edit, and contribute to several growing virtual cities of these dynamically generated floor plans on the web site.

“Apartment” seems to work best when its logic feels satisfyingly “right”, when words go into the places that we might expect them to, but what really holds our attention is seeing how these minor expectancies add up to something greater (a unique space or territory carved by a multitude of words) that we cannot mentally fathom at the outset. Even more interesting is how the authors were able to program the system to recognize broad macro-patterns from the all of input data it receives and present it back to the users. The diagrams of virtual apartments are visualized in a way that users can see the relationships among various categories of collective mental concerns such as Work, Glamour, Body, Truth, Food, Intimacy, and Change along an additional dimension of time (days of the week on which users are creating these apartments).

Disappointment results only when an observed interaction between words does not seem to contribute to the meaning of the whole. For instance, as the words float through the rooms of the apartment, they continually attach and detach themselves from other words according to some inconsistent grammar rules, forming two or three word phrases. Though at times, poetic patterns of movement may emerge from this behavior, there is not any perceivable effect on the apartment itself.

Facade

“Facade” (2005), an award-winning independent cyberdrama, operates on an even higher level of artificial intelligence. (“InteractiveStory.net”, 2005) Over the course of five toilsome years, the creators Michael Mateas and Andrew Stern developed interactive cartoon characters that function as adaptive agents, independent of a prescribed storyline. The narrative changes

moment by moment in response to the user's choices. The user talks to the characters as an unseen first person conversant by freely typing in lines of dialogue. The program analyzes the text in fragments and determines how the characters should respond accordingly.

"Façade" is essentially a database-driven narrative that progresses dynamically, segment by segment, or one line of dialogue at a time, based on a history of user input. Operating on a similar principle, *Untitled Stream of Consciousness Project* stores text and audio clips in a database, retrieves certain ones based on the current status of particular variables, and assembles them dynamically.

2.4 Human Avatar Games and Simulations

Human avatars appear all over the world of new media. They occupy spaces as diverse as marketing web sites, console computer games, video teleconferencing, and virtual reality simulations, and they are designed to take on many different types of roles and forms in relation to their users.

The Sims, The Sims 2, and The Sims Online

The Sims franchise of games, including *The Sims 2* and *The Sims Online* (Maxis/Electronic Arts, 2002, 2003), is a suite of large-scale, detailed virtual experiences that offer players the opportunity to create and micromanage the daily life of a family, or neighborhood, of human avatars. The one-to-many creator-avatar relationship, in which the user can switch from one on-screen persona to another was somewhat of a novelty when it first came out.

The Sims, as the avatars are called, function like dolls or lab rats that have had their emotions and identities cut out and placed on a table for the user to tweak. This is certainly an

interesting treatment of reality. Such a separation of body and psychological factors also infuses *Untitled Stream of Consciousness Project*. However, *Untitled Stream of Consciousness Project* takes the idea further by examining the relationship between thoughts, emotions, and life occurrences, and blurring the line between the user's mind and that of the avatar. The blending of minds induces a stronger mental connection between the user, the avatar, and other users who share the avatar.

The Sims seems to have initiated the notion of multitasking in a game, giving players a variety of "modes" to alternate between and a wealth of accessories and statistics to keep track of. Despite its revolutionary features, the franchise is a good example of information overload and disrupted flow in a game. The user must manage lists of actions, personality indicators, job skills, need meters, and house goods. The purpose of a "meter" that tracks assigned attributes or an "inventory" of acquired goods is to provide a quick mental picture of a current situation so that a user can respond quickly and efficiently. However, when the menus that house this data become too extensive and unwieldy, the opposite effect can result. A disconnect may start to emerge in which a natural instinctive flow and pace can be disrupted, forcing players to constantly attach and then detach from their avatars. In *Untitled Stream of Consciousness Project*, users are constantly immersed within the avatar's psyche and experience his subjective point of view in audio segments.

Like The Sims, *Untitled Stream of Consciousness Project* encompasses certain archetypal activities and aspirations of everyday life in the suburbs such as getting a job and buying a house and uses architecture as way to visualize these processes. There is not any set way to "win" the game, and, like life, it continues indefinitely (until death). However, in almost every other way,

Untitled Stream of Consciousness Project represents a significant departure from the Sims franchise.

The Sims games present the daily life of a variety of colorful characters from a largely extroverted and objectified viewpoint. Players are given plenty of choices about their avatars' appearances, objects that they want to acquire, other Sims that they want to interact with, and decorative details they want to add to their houses. Conversely, *Untitled Stream of Consciousness Project* is a subjective and introspective game. Whereas the *Sims Online* functions primarily as one big chat room, users in *Untitled Stream of Consciousness Project* communicate nonverbally, their decisions about what thought-producing words and phrases to place into the avatar's mind being implicitly influenced by the choices of others. Moreover, the players do not have any control over the appearance of their transpersonal avatar, as the mind and emotions take precedence over physical traits.

The game presents a view of the suburbs as a cloud-space in which life structures arise and become symbolic "chambers of experience" inside of which the avatar is affected. The avatar's experiences inside locations are encapsulated aurally in the form of short sound clips, and no other humans appear on screen. Though time in the Sims can be sped up or slowed down at the player's whim, the digital clock is still an objectively rational one. *Untitled Stream of Consciousness Project* shatters logical time-space. Audio clips and the movement of the avatar transpire at ordinary rates while days pass in hyper fast-forward. In the "Mind" section of the interface, the avatar can be viewed close-up, but his facial expressions are displaced from the body that moves about in the Life View. (See *Methodology*) It offers a window to the avatar's emotions that changes in sync with his experiences and thoughts.

Perhaps most significant is how *Untitled Stream of Consciousness Project* differs from Sims thematically. One of its primary messages is that activities and experience alone, or the inability to fulfill the avatar's "aspirations", are not the main perpetrators of negative emotions. Rather, thoughts are the primary culprit. This is a quintessential distinction between Western and Eastern philosophy, and one that is deeply imbedded in the system's design.

Second Life

Second Life (Linden Research, 2007) is a massive multi-user virtual world in which users adopt a new persona, albeit in the form of a body and its numerous material possessions. It is a vicarious experience in which people can live out dreams and pleasures that they would not ordinarily be able to live out, or would be reluctant to live out, in the real world. The world has its own currency, real estate to purchase, social clubs, and other attractions. Unlike *The Sims* games, there is not any explicit psychological or emotional dimension. All activity is centered outside of the avatar's body.

Oddcast

A commercial online company called Oddcast showcases speaking 3D avatars that are available for purchase and deployment on web sites. () These avatars have individual personalities; their eyes follow the user's mouse and they verbally and emotionally react when the user clicks on their face or torso. In *Untitled Stream of Consciousness Project*, the avatar absorbs the emotional thoughts of multiple users, and displays the emotions in the form of universal facial expressions, but does not display a particular personality or awareness of the

user. In this way, the avatar gains a relatable expressiveness, but is not reduced to an individual persona that is separate from the user.

2.5 Interactive Video

I have spent considerable time studying and experimenting with pre-recorded interactive video as an artform in various contexts on and off the Internet. With the increasing support for rich multimedia content on the World Wide Web, interactive video has enjoyed a noticeable resurgence since it quickly fell out of favor in the mid to late 1990s. In its heyday as a laser disc technology in the 1980s, prior to the proliferation of more flexible and cost-effective 3D technologies, computer-processed video was capable of providing hyper-realistic images for users to interact with. (Horowitz, 2005) However, particularly in the case of games, interaction was often confined to “branching”, in which one video clip would spawn another based on broad multiple-choice-type decisions.

Full-motion Video Games (“Interactive Movies”)

Beginning with *Dragon’s Lair* in 1983, this genre of game-making involved the use of pre-rendered live action or cartoon video sequences to present interactive stories with limited player involvement. (Horowitz, 2005)

Video Objects and Video Avatars

Virtual reality and tele-immersive applications treat video as a more malleable entity, segmenting “video objects” from their original backgrounds and using them in three-dimensional or mixed reality environments. Video objects derived from moving images of humans that are designed to either represent or interact with the user are called “video avatars”. They are less

commonly employed than 3D avatars, but can be found across several different domains, including dynamic web sites, digital games, telepresence, and virtual reality. *Untitled Stream of Consciousness Project* utilizes a video avatar as opposed to a 3D one for several reasons that are discussed in *Methodology*.

On the Internet, many web sites created with Macromedia Flash are employing video in an object-oriented fashion, blending it seamlessly with photographs, animations, and other kinds of graphics as opposed to presenting it in a standard box with a controller. A futuristic site produced for Vodafone in the UK is a potent example. (“Vodafone”, 2007)

Tim Hawkinson

In 2002, an avant-garde artist named Tim Hawkinson created a surreal and somewhat grotesque robotic sculpture of his own face that he called *The Emoter*. (“ACE Gallery: Tim Hawkinson”, 2007) A hydraulic machine hooked up to the artist’s visage was programmed to trigger sensors that animate numerous individual facial fragments such as upper and lower eyelids, lips, eyebrows, and nose. The look and result is not realistic, but combines principles of artificial intelligence with a photo-video aesthetic quality. Though in *Untitled Stream of Consciousness Project*, I aim for a higher degree of naturalism and authenticity, the idea of breaking the face up into components or fragments is one that significantly informs the process I undertake in representing the avatar’s face. (See *Methodology*)

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