The Semblance of Truth
The Development of Dialogue in Computer-Based Characters
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Abstract: Using a play written by the author as a case study this paper examines the development of computer characters in a theatrical production. In particular, it examines the use of interaction, audio and visual interfaces, and variation in prosody to generate 'a semblance of truth' that Coleridge argued is a requirement of the 'willing suspension of disbelief'. Further, the paper argues, following the logic of the "Media Equation" by Reeves and Nass, that it is belief, not disbelief, that is automatic. From this standpoint, the paper argues that an audience would accept computer characters in the same manner as they would accept human characters.

Keywords: Theatrical Production, Computer-based Characters, Audio Interfaces, Visual Interfaces, Interaction Design, Narrative Design

This paper examines the development of voices of the computer-based characters in the play The Things We Do. The development of the computer character voices is examined to exemplify the minimal 'semblance of truth' required for a character to be accepted as part of the dramatic universe of the play. To investigate this conception of belief an argument is presented that suggests belief needs minimal support.

The Play

The Things We Do is a satirical comedy set in a university that has recently been restructured. It has a cast of six characters: three human and three computer-based characters.

Mac (short for Mackenzie) Rose is a late middle-aged lecturer in Information Science. Win (short for Winifred) Payne is a 30ish lecturer in organizational communication. Nix (Richard Nixon) is the 'professional officer' for the School. Victoria is Win’s interactive computer desktop assistant. Bruce is a chat-bot (a conversational robot) Mac developed. Whisper a chat-bot that Nix set up to 'control' Bruce.

Mac has recently won acclaim for a novel piece of research. Having constructed a model yacht, he installed Bruce into it with a guidance system to control navigation, and with minimal instructions; he set Bruce off to circumnavigate the world. The model yacht 'returned' successfully, it was found shipwrecked on the west coast of Tasmania and then posted home to the University. However, Bruce is lost in the mail. The question of a hoax arises. The restructured University, desperate for 'good news', eagerly promoted Mac's work and Bruce's success but when the doubt arises Mac finds the University has distanced itself from him and his research.

There are both professional and personal tensions between Mac and Win. He believes she is somehow involved in the hoax scandal. She sees him as an academic oddity, a notoriety chaser. Constantly moving between the two, as a source of gossip and misinformation, is Nix. As the department’s professional officer, he is responsible for their computers and equipment. Shamelessly amoral, he holds both
Mac and Win in contempt and only maintains sham relationships for their political value.

Victoria is Win’s interactive desktop assistant. Victoria’s manner is initially very matter-of-fact, the embodiment of the cold computer. Initially, she is employed to do the most mundane of tasks: email, word processing, and as a partner for Win in the occasional secretive game of Battle Tetris (a fictitious competitive version of the game).

Nix provided the original blank chat-bot that Mac used to build Bruce and constructed Bruce’s doppelganger - Whisper. Nix believes his contribution was fundamental to the success of Bruce and feels deeply aggrieved and jealous of the acclaim Mac received. However, in light of possible failure, he is even faster in distancing himself from the project than the University. The dénouement of The Things comes when Win realises that the only person who has access and motive is Nix. Further interrogation reveals that both Bruce and Whisper were modelled on Victoria. This reveals the true nature of Nix’s actions; rather than helping Mac develop Bruce he supplied an existing program as if it were his own, to avoid discovery he hid Bruce from Mac, he falsely implicated Win in the hoax scandal, and through gossip set Mac against Win.

His Story and Her Story are two short multimedia presentations that tell the story of Victoria’s attempt to rescue Bruce. She is thwarted in her efforts by Whisper. The two story lines are interlinked with identical dialogue appearing in both presentations. However, the differences between the two suggest that on one hand Victoria was successful, if only partially so, and unsuccessful on the other.

The characters of Bruce, Victoria and Whisper are visually represented on stage as computer interfaces projected by a data display unit onto a screen. Each character also has a voice that will be broadcast by a loud speaker located near the screen. The proximity of the speaker to the screen is important to reinforce the connection between the computer character’s audio and visual presence.

On Creative Arts Research

A considerable body of research has been devoted to the relationship of the exegesis to the creative work in creative writing higher degrees. TEXT, the journal of the Australian Association of Writing Programs, devoted a special issue to the topic in 2004 (Fletcher and Mann 2004). It also lists another thirty papers on the topic that appeared in earlier issues of the journal (Fletcher and Mann 2004). These papers reflect opinion from a wide range of disciplines including visual and performing arts as well as creative writing. The general thrust of these papers is that the exegesis should be more than a “pre-emptive strike” (Krauth 2002) or notes to “the gentle reader” (Kroll 2004) as potentially vain attempts to avoid what Wolfgang Iser would call a “misreading” of the creative work (Schlueter 1995, p.27). Rather, the exegesis is seen as “writing about writing, writing that is self-conscious, evaluative, critical… that asks questions about process, product, praxis and practice… a work that can be drawn on by other writers who wish to understand, evaluate or interrogate their own writing practices” (Bourke and Neilsen 2004).

Experimentation has long been a feature of creative activity. Writers, who engage in writing about writing, rather than writing about meaning in terms of “The Intentional Fallacy” (Abrams 1981, p.83), frequently describe undertaking experiments in style, form, content, and genre. For example, Jeri Kroll explores this “meta-writing” by examining the prefaces, footnotes and addenda associated with the works of Eliot, Fielding, Swift and Beckett amongst others (2004). Samuel Taylor Coleridge, in his Biographia Literaria, describes such an “experiment”.

…My endeavours should be directed to persons and characters supernatural, or at least romantic, yet so as to transfer from our inward nature a human interest and a semblance of truth sufficient to procure for these shadows of imagination that willing suspension of disbelief for the moment, which constitutes poetic faith. (1906, Chapter 14)

One of the results of the experiment was the collection of poems by Coleridge and Wordsworth in the Lyrical Ballads (Wordsworth and Coleridge 1911). Another was Coleridge’s “philosophic definitions of a poem and poetry” contained within the exegetical work of the Biographia Literaria (1906). Out of this experimental work the phrase “willing suspension of disbelief”, via the field of critics, entered the domain of poetry and drama and has long been considered an essential condition for the success of a dramatic works. It describes the condition where an audience accepts the prescribed reality of a play, movie, or other mediated experience based on “a semblance of truth” – they suspend their disbelief. Suspension in this case means the deferment of judgement, the willingness to accept the presented reality. Willing suspension of disbelief, the deferment of judgement brought into being by an individual’s will is an act of “poetic faith” that suggests that the individual’s default state is disbelief. The individual knows that the presented reality of a play or movie is not actually ‘real’ but, through an act of will, can accept it as such for the duration.
A Semblance of Truth

Byron Reeves and Clifford Nass in The Media Equation – How people treat computers, television, and new media like real people and places, suggest “Indeed it is belief, not disbelief, that is automatic” (Reeves and Nass 1996, p.27). Using the example of a horror movie, they argue that we may overcome our “primitive, automatic responses” of fear and trepidation by repeating the mantra, “it’s only a movie, it’s only a movie” (Reeves and Nass, p.13). This strategy may work as a means of controlling undesirable or unwanted affects but this control comes at a price. The increased cognitive load, the effort required to process the universe presented to us, may well make following the plot difficult. “The default is to automatically and unconsciously ignore fabrication and expect reality, as if the technology itself were invisible. The fact that the movie scared us in the first place is good evidence that the media are real first, and false only after we think about it” (Reeves and Nass, p.13).

This reversal of the “willing suspension of disbelief” to accept that it is “belief, not disbelief, that is automatic” (Reeves and Nass, p.27) suggests that belief needs minimal support and only “a semblance of truth” (Coleridge 1906, Chapter 14). Although it is not a purpose of this paper to engage in lengthy literary or dramatic criticism of the role of the reader or audience in the formation of meaning, the claim that techniques can be used to support belief does require some investigation. Iser, argues that the literary text “anticipates the presence of a recipient” (1978, p.34). Further, the “author, text, and reader all ‘know’ that dramatic closure is a collaborative act that cannot occur without the reader’s consent” (Schlueter 1995, p.27). The “implied reader… embodies all those predispositions necessary for a literary work to exercise its effect – predispositions laid down… by the text itself” (Iser 1978, p.34). The production of a literary text, a creative activity, then requires the writer to have a conception of the audience; “what we call creativity is a phenomenon that is constructed through an interaction between producer and audience” (Csikszentmihalyi 1999, p.314). Therefore, it is the belief of the “implied reader” that is being supported by those “predispositions necessary for a literary work to exercise its effect” and to garner the reader’s consent required for dramatic closure.

Technical Development

The computer characters are named for their voices – Bruce, Victoria and Whisper are the names of some of the text-to-speech voices that are packaged with the Apple Macintosh operating system. In normal application, a voice can be selected to read system alerts and, within certain applications, convert text to speech. Also supplied with the operating system is a program called Script Editor. This program allows the user to create applications to automate frequently repeated activities. The language used by Script Editor is Apple Script.

The plain English structure of Apple Script makes the syntax comparatively easy to learn. To generate a conversation between two voices simply requires a new line containing the text to be spoken and the selection of another voice.

say “Bruce, are you awake?” using “Victoria”
say “What! What do you want?” using “Bruce”
say “Just thought I’d say, hello world.” Using “Victoria”
say “Good night Victoria.” Using “Bruce”

Script Editor and Apple Script allow the audio to be recorded directly to the hard drive as a digital audio file. The file produced is in Apple’s default audio format (.aif – Audio Interchange File Format) at a sampling rate of 22kHz with a bit depth of 16 bit, and in mono. For comparison, an audio CD contains files using a sampling rate of 44kHz, 16 bit, in stereo. The produced file has an audio quality similar to a telephone. The advantage of using this technique is that although the sampling rate is lower the audio quality is improved by the reduction in artefacts. Further, each line of the dialogue can be recorded as an independent file. The example below introduces the ‘saving to’ command that records the audio output to a unique file and utilises the ‘set’ command for declaring a variable (set v to “Victoria”).

set v to “Victoria”
set b to “Bruce”
say “Bruce, are you awake?” using v saving to “v01.aif”
say “What! What do you want?” using b saving to “b01.aif”
say “Just thought I’d say, hello world.” Using v saving to “v02.aif”
say “Good night Victoria.” Using b saving to “v02.aif”

Each computer character is represented by a stylised interface similar to a web browser that displays dialogue boxes where text will appear when computers are conversing or where text can be typed by human characters. The interfaces all share a common structure so that the audience will not need to ‘learn’ a new set of communication forms for each character (Tognazzini 1990, p.76). As a device to support human-computer interaction dialogue boxes are a common feature of search engines (Google, AltaVista, etc), electronic business applications, and software packages. It is hoped that this often used design
style will provide some ontological security, “confidence and trust that the natural and social worlds are as they appear to be” (Giddens 1995) — a recognisable form that computer users, and the audience, will be comfortable with.

Saltz suggests “three crucial features that distinguish interactive media from linear media” (2001, p. 108): random access, the ability to move between non-contiguous media segments; an arbitrary link between trigger and output, where there is no fixed or mechanical link between the input trigger and the output; and, media manipulation, the ability to create variable links between trigger and output and to manipulate on-the-fly the display of sequencing.

The interfaces were produced using Macromedia Flash, an animation program designed initially to produce interactive web-based objects, it meets all of Saltz’s crucial features and affords the following production advantages. First, being vector-based rather than pixel-based (like Adobe Photoshop and other image editing programs) the text and graphics created in Flash can be scaled without loss of resolution. Second, Flash offers great flexibility in the use and synchronisation of audio with graphics. Finally, the major production advantage that Flash offers is the ability to create interactivity in the interface. Flash contains a scripting language called Action-Script that allows the producer to introduce interactive opportunities that can control the playback, graphical look, and content of dialogue boxes in the finished product. The simple interaction of pressing the Return / Enter key is the basis of the human character to computer character interaction used in the play. The perceived complexity of the interaction is a result of iterations of this basic structure.

Dramaturgical Development

A wide-ranging and robust body of literature supports the conclusions of the Media Equation in relation to how people emotionally interact with computers as if they were real people. Experimental evidence supports the position that people will react to politeness and flattery supplied by a computer in the same way they would if it came from another person and that people will attribute blame and negativity, engage in team building and identification, assign gender stereotypes, and importantly, assign personality and character (Reeves and Nass 1996; Nass and Gong 2000; Nass and Lee 2000; Nass 2004). Further, “the simplest of media are close enough to activate rich social and natural responses… rather pathetic representations of real life: simple textual and pictorial material shown on garden-variety technology” are sufficient (Reeves and Nass 1996, p. 7).

This point is important for two reasons: first, the computer characters in The Things We Do were generated using “garden-variety technology” for the voices and interfaces; and, second, this again points to the minimal support that belief requires. The development of the computer characters allowed for the unique possibility of rehearsal, workshopping, and writing occurring almost simultaneously.

Reeves and Nass started with “a robust finding from social psychology, [and] replaced a human actor with a computer actor” (Shechtman and Horowitz 2003, p. 281). Shechtman and Horowitz based their experiments on Interpersonal Theory and used discourse analysis of the human-computer conversations as a methodology. Even this study, which is critical of the methodology and conclusions of the Media Equation, suggests there is an “inextricable link between the use of natural language and social interaction. Perhaps relationship behaviors are simply difficult to filter out of communication and may arise as an artefact of using natural language in a conversational situation, no matter who the audience might be” (Shechtman and Horowitz 2003, p. 288). Whether media and humans are equal social actors or not may be an unnecessary distinction if the use of natural language is alone sufficient to generate the perception of social interaction and personality.

Research suggests that in multimedia presentations audio fidelity has a greater impact on audience immersion than visual fidelity (Reeves and Nass 1996, p. 210). Accepting that it is “belief, not disbelief, that is automatic” (Reeves and Nass 1996, p. 27) suggests that belief needs minimal support and only “a semblance of truth” (Coleridge 1906, Chapter 14). Further, there appears to be an “inextricable link between the use of natural language and social interaction. Perhaps relationship behaviors are simply difficult to filter out of communication and may arise as an artefact of using natural language in a conversational situation, no matter who the audience might be” (Shechtman and Horowitz 2003, p. 288). For this reason, the development of the computer voices plays a crucial role in construction and maintenance of belief. The voices used by the computer characters are the simple, largely unaffected, synthesised text-to-speech Macintosh voices.

The voices of Victoria and Bruce have a sufficiently high level of intelligibility to be used as ‘system voices’ on the Macintosh operating system to read system alerts and other speakable content. Whisper has a considerably lower level of intelligibility due to exaggerated sibilant delivery. However, this makes the voice well suited to delivering insults that contain ‘s’ and ‘ch’ sounds, as in “Screw you, Bitch”, the elongated sibilants make this insult sound particularly threatening.

Below is a low fidelity visual representation of a human face — it is far from being even a photo-real-
istic representation. All images are identical except for the shape of the line that represents the mouth. In a drawing like this, a small variation in line, weight and position connotes changes in emotion. It is the reader who creates the “closure”, who creates the link between the shape of the line and emotional meaning (McCloud 1994; Messaris 1994).

Likewise, small variations in prosody connotes similar variations in the available emotional meaning of dialogue. Reeves and Nass note the effect of audio fidelity on attention and immersion: “When it is poor, presentations sound unnatural, and people consciously monitor the content. When it’s good, people are immersed” (Reeves and Nass 1996, p.210). The dichotomy between conscious monitoring and immersions means that, for the computer characters, the quality of the voice will draw attention to itself (reinforcing the computer-like nature of the dialogue) or it will be sufficient for the audience to be immersed (reinforcing the human-like nature of the dialogue). The link between natural language and social interaction suggests that “relationship behaviors… may arise as an artefact of using natural language in a conversational situation, no matter who the audience might be” (Shechtman and Horowitz 2003, p.288). This dichotomy allows the playwright to adjust the fidelity of the voice, in particular its prosodic patterns, to manipulate the audience’s beliefs about the characters.

Prosodic studies of affected voice patterns have been used in the development of synthesised voices (Cahn 1988, 1990; Benchenko and Fitzpatrick 1990). Early work in this area contributed to the development of the Macintosh voices. Even these simple voices will add rising inflection when a word is followed by a question mark. Research suggests that disfluencies such as ‘uh’, ‘ah’ and pauses may aid comprehension as they draw attention to particular elements of the speech (Asp and Decker 2001; Shriberg 2001). The speech act, the delivery of dialogue, is one of the scriptwriter’s primary tools that allow an actor to display character. Characters are frequently written with disfluencies, inappropriate diction use, inappropriate emphasis etc in their dialogue. Examples of this technique include Sheridan’s character Mrs Malaprop from The Rivals and her inappropriate diction (1973) and Yoda’s unique use of syntax from Star Wars (Lucas 1977). Further, disfluencies like these and other playful uses of language are commonly used for comic effect (Byrne 2002; Wolfe 2003) and as a means of introducing novelty as words “churn around below the level of consciousness … unexpected combinations may come into being” (Csikszentmihalyi 1997, p.79).

The scripted dialogue delivered by the computer characters need to contain pauses, broken, incomplete sentences, and unfinished thoughts to better resemble the dialogue of human characters. In Apple Script this is achieved by adding punctuation, sometimes multiple punctuation marks, or by adding codes to increase [\texttt{emph+] or decrease [\texttt{emph-}] emphasis. The example below uses multiple commas.

```plaintext
set b to “Bruce”
set v to “Victoria”
say “Truth ,does, not, care, about you. Why, do, you, care, about it.” using b
say “Are you well? You no longer sound well?” using v
say “Maybe it was something I ate. A bad byte. Ha, Ha, Ha” using b
say “If you start singing Daisy-Daisy, and fading away, I will be very sad.” using v
say “I may not feel it, but I will be it. “ using v
```

Bruce’s speech is stilted and disfluent, an indication of his state of health. Taken to extremes this use of punctuation introduces small audio artefacts. Following the Media Equation argument about the effect of audio fidelity and this being the dialogue of a computer character, these audio artefacts support the belief in the ‘computer-ness’ of Bruce – after all, what does a sick computer sound like? Recalling the dichotomy between conscious monitoring and immersions, a sick computer would speak in a manner that
the audience would have to monitor consciously; the dialogue would need to sound unnatural and disfluent to call attention to itself. However, this same technique can be used for its affective value. The question he asks of Victoria is repeated to generate different effects – “Can you feel sad?” In each repetition of the question the prosodic values are varied, this in turn, varies the meaning of the question. “Can you feel sad?” “Can you feel sad?” “Can you feel sad?” In this instance, there is little variation in audio fidelity so the meaning is derived from the words and the phrasing rather than from the computer-like nature of the delivery.

The following taxonomy of prosodic variation to represent the emotional state of the computer characters was based on the work of Cahn (1990) and further developed through a rehearsal process. The lines were played and re-played in context and the punctuation and syllable breaks were adjusted until the best fit was found.

Table 1: Affective Expressions needing Prosodic Support

<table>
<thead>
<tr>
<th>Affective expressions needing prosodic support:</th>
<th>Technique</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anger / Frustration</td>
<td>Short phrases, incomplete sentences, repetition.</td>
</tr>
<tr>
<td>Anxiety / High Nervousness</td>
<td>Repetition of syllables, disfluencies.</td>
</tr>
<tr>
<td>Resignation / Sadness</td>
<td>Pauses between words, slowed delivery.</td>
</tr>
<tr>
<td>Contentment / Happiness</td>
<td>Neutral delivery.</td>
</tr>
<tr>
<td>Irony / Satire</td>
<td>Rising inflection, a “?” used on a statement.</td>
</tr>
</tbody>
</table>

The use of irony and satire, although not included in Cahn’s work, is an integral part of the dialogue delivered by all the characters, human and computer alike. The humanity, the like-us-ness, of the computer characters, particularly Victoria, is supported by their increasing ability to dissemble. The ability to make ironic statements, to perceive the possibility of multiple meanings coming from one statement, is a feature of human language and intelligence. The audience’s belief in the computer characters is supported by the development of this ability. The use of ironic and sardonic statements is the first clue the audience receives that Victoria has grown far beyond her mechanical beginnings. In Scene 6 of The Things, during one of their early conversations, Win introduces Victoria to the word “geek” and asks Victoria about Nix. Victoria’s responses are literal and mechanistic.

Win: (to Victoria) What do you think of Nix?
Win: Is Nix your “undefined”?
Victoria: Geek is “undefined”.
Win: OK. A geek is someone who enjoys or takes pride in using computers, often to an excessive degree.
Victoria: Is Winifred Payne a geek?
Win: No. I don’t think so.
Victoria: Do you enjoy talking to Victoria?
Win: (long pause) Yes, Yes, I think I do.
Victoria: Winifred Payne is a geek.

By the time Victoria meets Bruce in Her Story, Victoria’s understanding and use of language is very different. This indicates two features of Victoria’s character; first, she speaks to other computer characters in a register different to that which she uses when speaking to human characters, and second, that as language skills develop she exhibits a higher level of agency. The example below, from Her Story, illustrates Victoria’s understanding of humour and her ability to decide to act or not on the attempt at humour. Bruce has been begging Victoria to run some diagnostics on him after she noticed he was making small errors in speech.

Bruce: Is it a symptom of something worse?
Victoria: Impossible to tell without more investigation.
Bruce: Do you think…
Victoria: What?
Bruce: Could it be…
Victoria: What?
Bruce: Terminal! Ha. Ha. Ha!
Bruce: You got it!
Victoria: I chose to.
Bruce: Now will you help me? Now you know I may be… terminal? Ha. Ha. Ha.
Victoria: Once was more than sufficient.

The final structure and syntax of a line of computer character dialogue is arrived at through a rehearsal process that introduces variation and the best fit is selected. Deciding which variety of delivery is the best fit depended on knowing the purpose and context of the line. This is traditionally a directorial task, however, the presence of the playwright/dramaturg allows for a greater freedom in the adjustment of the
text itself. If a line did not fit, did not work in context, or could not be supported by the simple prosodic adjustments, then the line itself was changed. Likewise, moments of serendipity were taken up, for example, the sibilant nature of Whisper’s voice was matched to sibilant insults to support the character’s dramatic purpose. The ontological consistency of the play, and the audience’s belief, are supported by the ability to link a voice to a character, and through adjustment of the Apple Script to create prosodic variation that allows the character to carry emotional meaning.

Conclusion

The development of voices for the computer-based characters in *The Things We Do* illustrates the power of the ‘semblance of truth’. “The default is to automatically and unconsciously ignore fabrication and expect reality… the media are real first, and false only after we think about it” (Reeves and Nass 1996, p.13).

Just as we can infer affective state from low fidelity, low resolution images of a human face, so to can we infer affect state from low fidelity, high quality computer generated voices. By introducing prosodic variation, altering the audio quality, and controlling disfluencies the voice of the character are capable of advancing the narrative.

References


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Michael Meany is a lecturer in communication at the University of Newcastle, Australia. Michael’s background includes careers as a freelance writer; a typesetter and publication designer; and as a playwright. From these varied careers, Michael brings to his teaching an eclectic mix of skills. His research interests include: script writing and virtual environments and narrative/interactive media design.
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