

VHML – The Virtual Human Markup Language

Andrew Marriott

School of Computing

Curtin University of Technology

raytrace@cs.curtin.edu.au

Abstract

Research into Virtual Conversational Characters, Embodied Character Agents, etc has recently made it possible to have Talking Head interfaces to applications and information. Users may, with plain English queries, interact with a believable computer generated image that responds to them with realistic speech using textual information coming via a Dialogue Manager from a domain knowledge base. If MPEG-4 technology is used, the interaction can take place across a very low bandwidth channel and hence is available to the home user. This presentation details the research being done at Curtin University in creating a Virtual Human Markup Language (VHML) that allows these interactive Talking Heads to be directed by text marked up in accordance with the XML standard. This direction makes the interaction more effective. The language is designed to accommodate the various aspects of Human-Computer Interaction with regards to Facial Animation, Body Animation, Dialogue Manager interaction, Text to Speech production, Emotional Representation plus Hyper and Multi Media information. This presentation also points to audio and visual examples of the use of the language as well as user evaluation of an interactive Talking Head that uses VHML. VHML is currently being used in several Talking Head applications as well as a Mentoring System. The MetaFace system is the first full implementation of a VHML-based interactive information provider. The VHML development and implementation is part of a three-year European Union Fifth Framework project called InterFace.

The Virtual Human Markup Language (VHML) uses / builds on existing (de facto) standards such as those specified by the [W3C Voice Browser Activity](#), and adds new tags to accommodate functionality that is not catered for.

The language is XML/XSL based and consists of the following sub-systems:

- DMML Dialogue Manager Markup Language
- FAML Facial Animation Markup Language
- BAML Body Animation Markup Language
- SML Speech Markup Language
- EML Emotion Markup Language
- XHTML HyperText Markup Language

Although general in nature, the intent of this language is to facilitate the natural and realistic interaction of a Talking Head (TH) / Virtual Human or any computer generated character agent with a user via a Web page or application (see example at bottom of page).

References

VHML (2001). Virtual Human Markup Language. Online at <http://www.vhml.org/>.

Audio examples <http://www.vhml.org/examples/audio/>

Video examples <http://www.vhml.org/examples/movies/>

Beard,S and Reid,D.(2002) "MetaFace and VHML: A First Implementation of the Virtual Human Markup Language." AAMAS workshop: Embodied conversational agents - let's specify and evaluate them! , Bologna Italy. July 16th 2002. <http://www.vhml.org/workshops/AAMAS/papers/beard.pdf> <http://www.metaface.computing.edu.au/>

Marriott, A., Beard S, Haddadi H, Pockaj R, Stallo J, Huynh Q and Tschirren B (2001b). "The Face of the Future." *Journal of Research and Practice in Information Technology* **32**(3/4): 231-245.

Marriott, A. "A Facial Animation case study for HCI: the VHML-based Mentor System", In "MPEG-4 Facial Animation - The standard, implementations and applications", Editors: Igor Pandzic and Robert Forchheimer. John Wiley, 2002.

<sad>

You <emph>said</emph> to me once <pause length="short"/> that pathos left you unmoved, but that beauty, <emph affect="b" level="moderate">mere</emph> beauty, could fill your eyes with tears.

</sad>