

Facial Animation in Games – Notes & References

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Software: Applications

annosoft, *Lipsync Tool*. [computer program], Richardson, TX: annosoft

Lipsync Tool is available in either a textless, automatic recognition version or an audio and text version, which performs an equivalent text-to-phoneme stage. It is available from <http://www.annosoft.com/lipsync-tool>

OGRE, *OGRE (1.7.1) [Cthugha]*. [computer program], online: OGRE

OGRE, or Open Graphics Rendering Engine, is an open source graphics engine. Included with the source code are a number of samples, one of which (the Facial Animation sample) was referenced. OGRE is available from <http://www.ogre3d.org>

Games

Team SOHO. 2001. *The Getaway*. [computer program], London, UK: SCEE

Discussed in the Gamasutra "Talking Heads" article by Gavin Moore.

Ion Storm. 2000. *Deus Ex* [computer program], London, UK: Eidos

An early example of lip sync created by the amplitude of the voice sample, with phoneme shapes.

Valve. 1998. *Half-Life* [computer program], Los Angeles, CA: Sierra Entertainment, inc.

An early example of lip sync created by the amplitude of the voice sample, with jaw movement.

Valve. 2004. *Half-Life 2* [computer program], Los Angeles, CA: Sierra Entertainment, inc.

A good example of a well featured facial animation system.

Valve. 2009. *Left 4 Dead 2* [computer program], Kirkland, WA: Valve Corporation

Another good example of a well featured facial animation system, with environment driven expressions (in this case, mostly displaying fear). The engine is an update of Half-Life 2.

Lionhead. 2001. *Black and White* [computer program], Redwood, CA: Electronic Arts

An example of facial expressions being present on a non-human character, with reference to it being driven by the creature's internal AI state.

Bethesda Game Studios. 2008. *Fallout 3* [computer program], Rockville, MD: Bethesda Softworks

An example of a game featuring a very large amount of dialogue (reportedly over 40,000 lines), and character interaction using said dialogue.

Papers:

Fiscus, J., Ajot, J., Garofolo, J., 2007. *The Rich Transcription 2007 Meeting Recognition Evaluation*. Available from: http://www.itl.nist.gov/iad/mig//publications/storage_paper/RT07Results-v08.pdf [accessed 13/05/2010]

Information on the accuracy of speech recognition software.

Simpson, J, 2004. A Simple Real-Time Lip-Synching System. *In*: Kirmise, A., ed. *Game Programming Gems 4*. Hingham, MA: Charles river Media, 607-611

A short article about amplitude-based lip synch, wherein the character's lips are moved based on the amplitude of the voice sample they are given.

Websites:

Lander, J., 2000. *Read My Lips: Facial Animation Techniques*. Gamasutra. Available from: http://www.gamasutra.com/view/feature/3179/read_my_lips_facial_animation_.php

A discussion on what phoneme types are appropriate to use in animation, and how sound is produced by the human vocal chords and mouth.

Moore, G., 2001. *Talking Heads: Facial Animation in The Getaway*. Gamasutra. Available from: http://www.gamasutra.com/view/feature/3089/talking_heads_facial_animation_in_.php

Discusses a skeleton based facial animation system, that both performs lip synchronisation and allows for the insertion of expression data into the text input.