Carnival: a modular framework for automated facial animation

Citation for published version:

Digital Object Identifier (DOI):
10.1145/1836845.1836851

Link:
Link to publication record in Edinburgh Research Explorer

Document Version:
Peer reviewed version

Published In:
ACM SIGGRAPH 2010 Posters

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Facial animation is difficult to do convincingly, particularly when synchronizing with speech. There are various ways to automate facial animation:

- Performance-driven animation
- Audio-driven animation
- Audio-visual text-to-speech synthesis (AVTTS)

The problem with these solutions is they bring together software and data formats from different fields—in particular speech technology and graphics technology—that are not well integrated.

- Conversion of facial dynamics into animation is cumbersome, slow and offline.
- Lack of live connection between speech and rendering pipelines. Difficult to backtrack animation problems, or see outcome of edits in the speech processing level.
- No standard control interface for different facial models, so adaptation process must be repeated in each case.

The core of our solution is a platform independent C++ API.

Software framework called “Carnival” which places speech and graphics components within a single object-oriented system.

- Fast and automatic end-to-end processing
- Real-time animation and linked display of time-varying representations for instantaneous feedback/feed-forward information
- Standardized object interfaces for easy integration of new components

The API may be used for fast prototyping of automated animation systems.

Suitable for performance-driven, audio-driven, or AVTTS applications.

Our implemented tool built on the API is suitable for in-house industrial or academic use.

Applications