

An Extensible Framework for Interactive Facial Animation with Facial Expressions, Lip Synchronization and Eye Behavior

Queiroz, R. , Cohen, M., Musse, S.

ACM Computers in Entertainment (2009)

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Goal

Easily **extendable** & **robust** framework for facial animation

Features

- MPEG-4 facial animation data
- High level description of facial actions and behaviours
- Supports Real-time interactions
- Three real applications

Requirements

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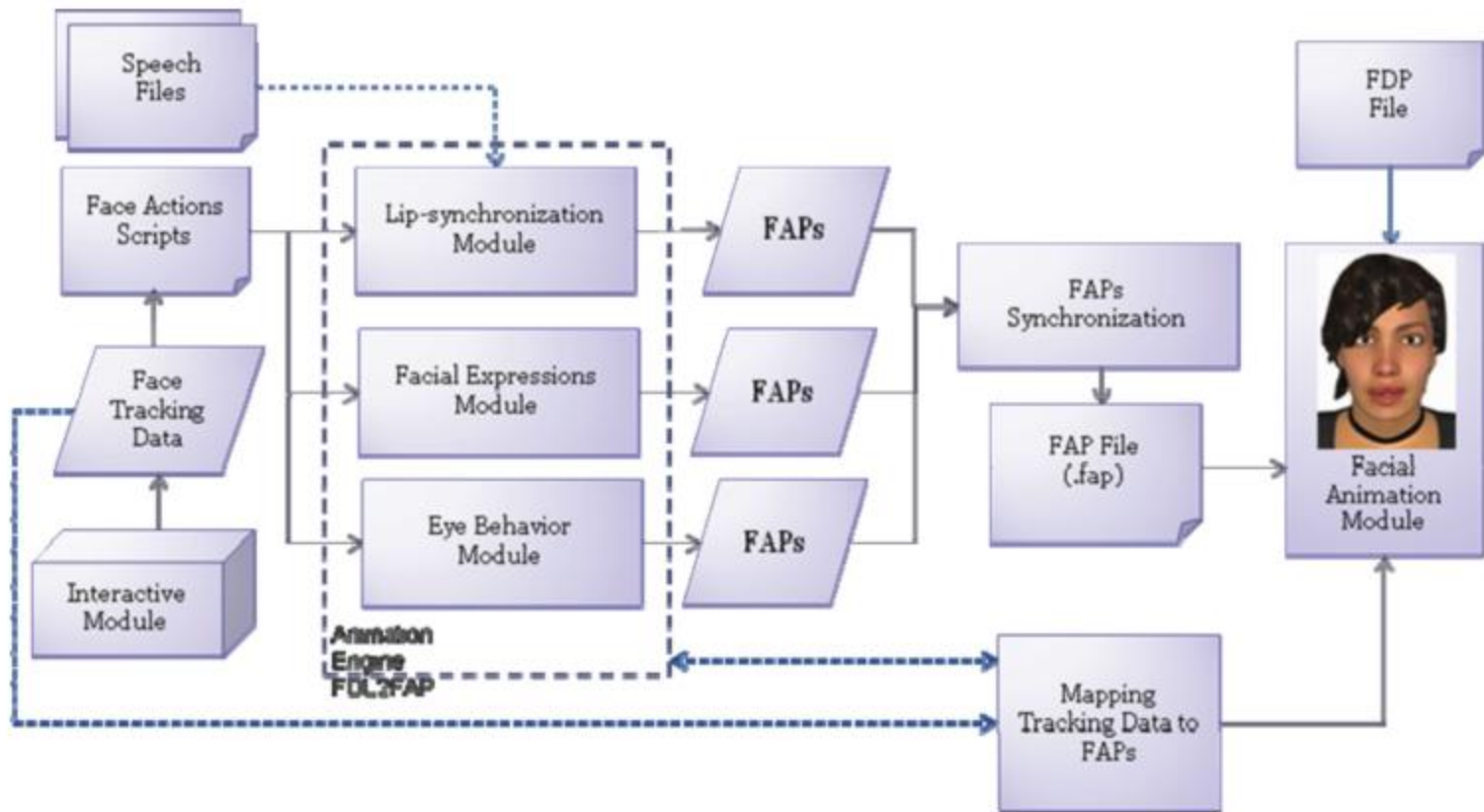
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- mesh deformation algorithms capable of realistically represent the behaviour of facial muscles;
- an interface that can be understood by both computers and humans;
- Easy incorporation of animated faces in other applications;
- Generation of animation in real time, without the need of previously recorded animations.

Architecture

- Animation engine – Xface¹ toolkit
- Relies on the MPEG-4 standard

¹Xface: Open source project and smil-agent scripting language for creating and animating embodied conversational agents

Architecture



Scripts

```
FDL = {  
  speakSound = "hastalavista.wav",  
  speakText = "hastalavista.txt"  
  expressions = {  
    expressionScript = {"joy", 100},  
    head = "default", {"sadness", 100},  
    eyesScript = "eyes", {"surprise",  
    output = "animation", {"anger", 50},  
    {"disgust", 50},  
    {"fear", 100},  
    {"trust", 100},  
    {"tongueout",  
    {"inlove", 100}
```

```
Sentence = {  
  {"silence", 11},  
  {"A", 6},  
  {"kg", 1},  
  {"Q", 1},  
  {"nl", 3},  
  {"sz", 3},  
  {"I", 6},  
  {"A", 2},  
  {"silence", 27},  
}
```

Results

- Short film
- **Completely** scripted
- [Tracking is Believing - YouTube](#)

Results

- Real-time applications
- “Virtual Director” & “Following Faces”
 - System detects face continuously (OpenCV) and welcomes users
 - The eyes follow the user’s face
- “Virtual Mirror”
 - Map visual features to the facial animation parameters

Conclusion

- New expressions by combining
 - Speech
 - Eye behaviour
 - Facial expressions
- Animation generated in the MPEG-4 format
- Face Description Language for scripting the animation

Why is it good

- Good State of the Art for automatic facial animation
- Use of MPEG-4 FA standard
- Automatic generation of new animation
- Modular framework(?)

Why is it bad

- Completely associated with the MPEG-4 Standard
- How did they define the behaviours?
- How do they define the behaviour of the interactive module?
- Abstract Interactive module

Questions? Feedback is welcome

