



THAL-k: TalkingHead Animation Library

CG³ Lab - University of Cagliari [Sardinia / Italy]

Computer Graphics and Computationally Geometry Cagliari Group - UniCA Dept. of Mathematics and Computer Science

PISA
EGIT2013

[abstract]

We present here the first release of an SDK (Software Development Kit) for mobile devices supporting the animation of 3D talking heads: THAL-k. The SDK is constantly evolving and here we discuss the features of version 1.0. This library is thought as a support for all the developers wishing to build applications on smartphones or tablets including avatars to enhance the interaction functionalities. The main challenge we face is to provide developers with a complete SDK for the creation, customization and real-time animation of the models.

[THAL-k]

THAL-k includes all the models needed for the animation. In more detail, we have different meshes to represent each part of the head. For the entire head we use ten meshes: one for the skin surface, two for the hair (male and female) with relative textures, four for the tongue, throat and teeth (upper and lower) each with the appropriate texture, two for the eyes with related textures. We use fifty meshes for the labial movements. These fifty meshes are subdivided into different subset. Every subset is a ten mesh group necessary for each preloaded phoneme. In the subset, every mesh represents a different openness degree of the mouth following the phoneme pronunciation. In this way, playing with the mesh visibility, we obtain the labial animation. The texture necessary for the skin model is stored in the application's resources, but it is possible to use textures loaded from the SD card. In our library, there are two default faces' textures, one representing a man and another one for girl representation.

The work presented here is also due to a collaboration between University of Cagliari and Athlos S.r.l., an SMI based in Sardinia. Athlos have several business projects based on this work, especially using talking head in the field of tourism. Another perspective field of interest is in the medical environment, mainly for people affected by neurodegenerative diseases.

The next plans for the extension of THAL-k are:

- Personalize the 3D avatar starting from a photo taken on a mobile device, using a matching algorithm to decide which of several 3D models is more similar to the picture for its 3D representation; to obtain this it is necessary to extract the salient points of the image using a classification of the picture according to certain pre-established measures;
- Animate the model in a more fluid and realistic way increasing the number of meshes in the set used for animation, using techniques like eye blinking and look around simulation;
- Provide off-line processing tools in order to refine avatars and customize their geometry and texture.

[storyboard]

FEB
2013
APR
2013
MAY
2013
JUN
2013
JUL
2013

Android Version Beta Release

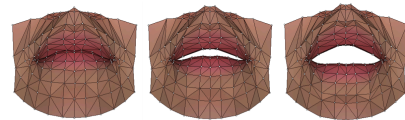
Android Version 1.0 Release

IOS Version Beta Release

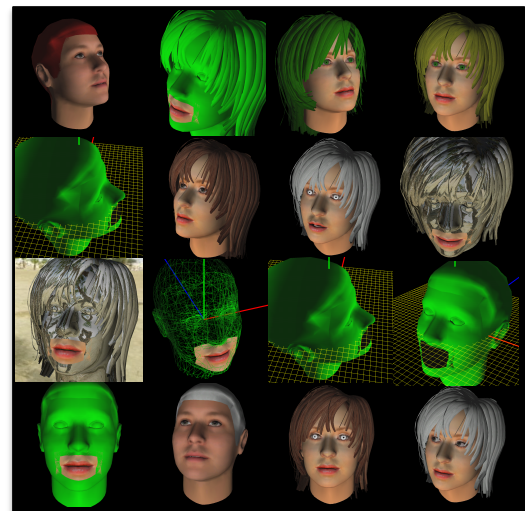
IOS Version 1.0 Release

Android Version 2.0 Release

[animation]



A phoneme with different degrees of openness (1/10, 5/10, 10/10)
Read the cited work [SS12] in paper for detailed information.



Screenshot from running application on HTC Sensation

[functionalities]

Gesture)) Pinch-to-zoom
Rotate

Colorize)) Hair
Eyes

View)) Wireframe
Model
Texture
CubeMap
SkyBox

Look)) Left
Straight
Right

Lips animation)) Start
Speaker sync
Stop

Texture)) High
Low

Move)) Up
Down
Random
Left
Right



Fabio Sorrentino
PhD Candidate at University of Cagliari
sorrentfabio@gmail.com



Riccardo Scateni
Associate Professor at University of Cagliari
riccardo@unica.it

