Fall 2008
The Iphone and Affective Computing

An Introduction
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Summary Fall 2008

- IPhone
  - Facegen
  - Blender
  - SIO2Engine
  - Maya
  - OpenGL ES 1.x
  - Objective C
  - Cocoa Framework
  - MAC OS X Programming.
Summary Fall 2008

- Health Promotion
- Text To Speech
- Speech Valence
- Latex and BibTex
Motivation

- Create affective mobile companions
- Create a standard on affective mobile devices.
- Understand hardware limitations.
- Learn new technology.
Coding for Mobile Devices

- IPhone
  - Objective C
  - C and C++
  - Java
- Android OS (G Phone.)
  - Java
- Blackberry
  - C++
  - Java
- Graphic Libraries in common: OpenGL ES 1.x
Why Developed on Mac OS X?

- Similar code between Mac Desktop & IPhone
- MAC OS is very popular between researchers
- Easier to test code due to the extensive available libraries.
- Powerful Operating System.
- Based on Free BSD.
Cocoa

- Apple Development Framework
- Comes from NeXT Computer
- NeXTStep (OpenStep) was used by
  - Government Intelligence Agencies
  - Financial Companies
  - Research Community
- Object Oriented Framework
  - In contrast to Carbon.
- Can call Carbon libraries.
Cocoa

- Speech Synthesizer
- Speech Command Recognition
- Audio and Video Libraries
- Different Graphics Engines/Libraries
- Simple and Elegant Code
- Rapid Development.
Objective-C 2.0

- Object Oriented Language
  - Influenced by Small Talk (Messaging)
  - C like syntax
- Garbage Collection available for Mac OS X 10.5.
  - Optional
  - User can still control memory like C++
- Breaks source code into two files like C++
  - Implementation (.m) and header definition (.h)
- Can interact with C and C++
Objective-C 2.0

- C++
  - If (x.intersectArc(35.0,19.0,23.0,90.0,120.0))

- Objective C
  - If ([x intersectArcWithRadius: 35.0
      centeredAtX:19.0
      Y:23.0
      FromAngle:90.0
      ToAngle:120.0])]
SIO2 Game Engine for the IPhone

[ Architecture ]
- Optimized File Format
- Unique Package Approach
- OpenGL ES v1.1 Compatible
- Written in pure C

[ Real Time Physic ]
- Rigid Body
- Collision Detection
- Soft Body *
- Particle System
- Fog

[ Multimedia & Special Effects ]
- Ambient & FX Sound
- Real 3D Stereo & Surround
- Realtime MP3 Playback
- Realtime MPEG 4 Playback
- Sun *, Flares *, Billboard, Clouds *, etc...

[ Lighting & Shadow ]
- Per-Vertex
- Light Mapping
- Projected Shadow *
- Projected Geometry *

[ Tool Chain ]
- Built around Blender (WYSIWYG)
- Exporter & Optimizer

[ Texturing ]
- Multi-Texturing
- Texture Filtering
- Anisotropic Filtering
- Transparent
- Semi-Transparent

[ Scene Management ]
- Fast Sorting & Culling System
- Event & Trigger System
- Scripting Support (Level & UI)
- Portrait & Landscape Mode
- Touch Screen & Accelerometer

[ Animation ]
- Camera & Object Path *
- Skeletal Animation *
- Keyframe Animation
DEMOS

- MAC OS X DEMO
- IPHONE DEMOS
MAC OS X Application.

Peter Piper picked a peck of pickled peppers

Volume 1

Rate 175
Facegen Export modes.

- Facegen
  - 3D Studio Max.
  - Lightwave 6.x
  - Maya ASCII
  - Softimage dotXSI 3.0
  - VRML 1.0 and 97
  - Wavefront (OBJ)
Facegen to IPhone

- Facegen export to OBJ
- OBJ to Blender.
- Blender to SIO2 Format.

Problems
- Facegen has a high resolution that IPhone cannot handle. This can be fixed using Blender.
Facegen to IPhone
Iphone Application

Are you stress enough?

RED  BLUE
GREEN  YELLOW
PURPLE  BLACK

Score:0   Missed:0

READY!

Start
Health Promotion System

- Intelligent.
- Aware of Affective States
- Aware of Personalities.
- Allow different theories to be used.
- Web Avatar Ready
Text to Speech Options

- AT&T TTS
- Festival TTS (Open Source.)
- Capella for the iPhone.
Text to Speech

- Juliette - French
- Mike - English
- Rosa - Spanish
- Crystal - English
- Alberto - Spanish
- Richard - English

- Using AT&T Natural Voices.
Speech Valence

  - By Cook, Fujisawa & Takamani.
Speech Valence

- Arousal has been proven to be relatively easy.
  - Speech Rate, Voice Intensity…
- Valance has proven to be difficult.
  - Happy–Sad, Positive–Negative, Etc..
Speech Valence

- Extracts high-order statistics from F0.
  - Fundamental Tone.
- Analysis of multiple pitch combinations
- 3 Tone combination.
- Does not relay in any musical scales of any kind.
- Problem is approach with
  - cluster algorithm
  - Psychoacoustics oh harmony perception.
References

- Cocoa Programming For MAC OS X
  - AARON HILLEGASS
- Evaluation of the Affective Valance of Speech Using Pitch Substructure
  - Norman D. Cok, Takashi X. Fujisawa, Kazuaki Takami
Questions

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