



Graphics and Media

State of the Union

John Stauffer

Senior Director
Graphics and Media







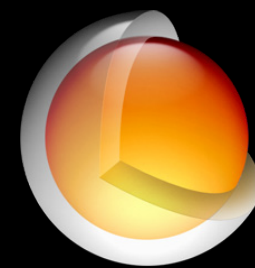
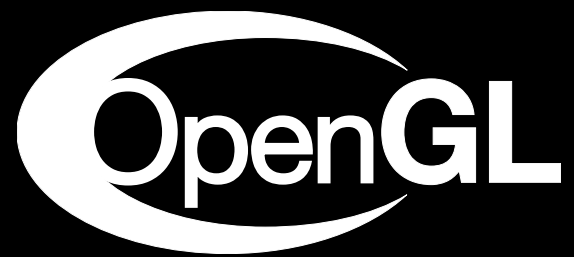


20+ Frameworks





Cocoa Touch



Low-level access



Core Animation



Mix and match

Cocoa

Graphics and Media

Core Services

Core OS

Common foundation

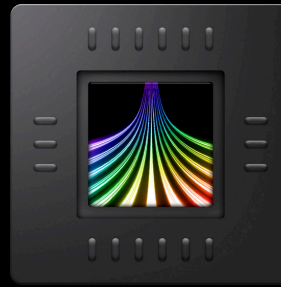
Cocoa Touch

Graphics and Media

Core Services

Core OS

Common foundation



Tuned for hardware







225,000

Applications

Thank you!

iOS 4



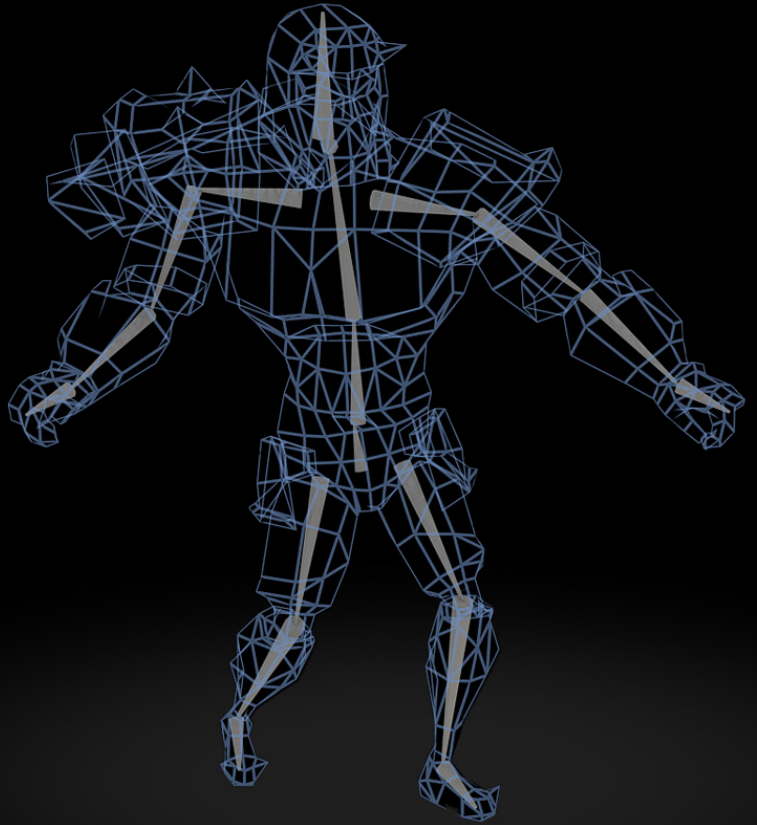
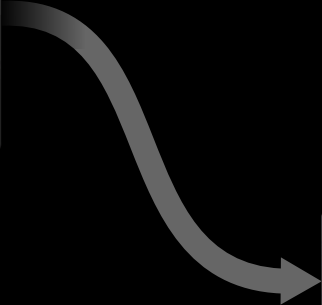
OpenGL ES
AV Foundation
HTTP Live Streaming
Game Center

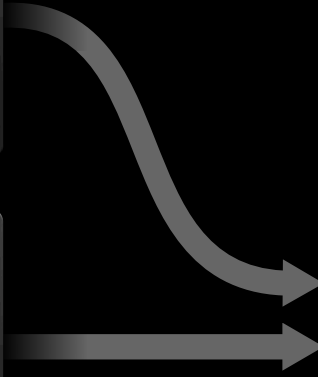
OpenGL ES

Geoff Stahl

Senior Manager
Graphics and Imaging

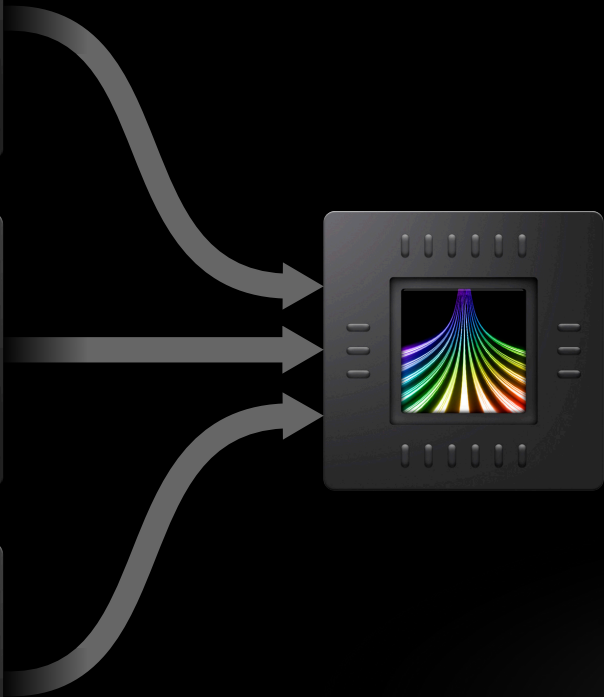
OpenGL|ES™







```
vec3 noiseinput =  
float f = noise3 (v  
f = abs (f) + 0.8;  
color = mix (color  
gl_FragColor = v
```



Demo

Extreme Ball

iOS 4



Full scene anti-aliasing

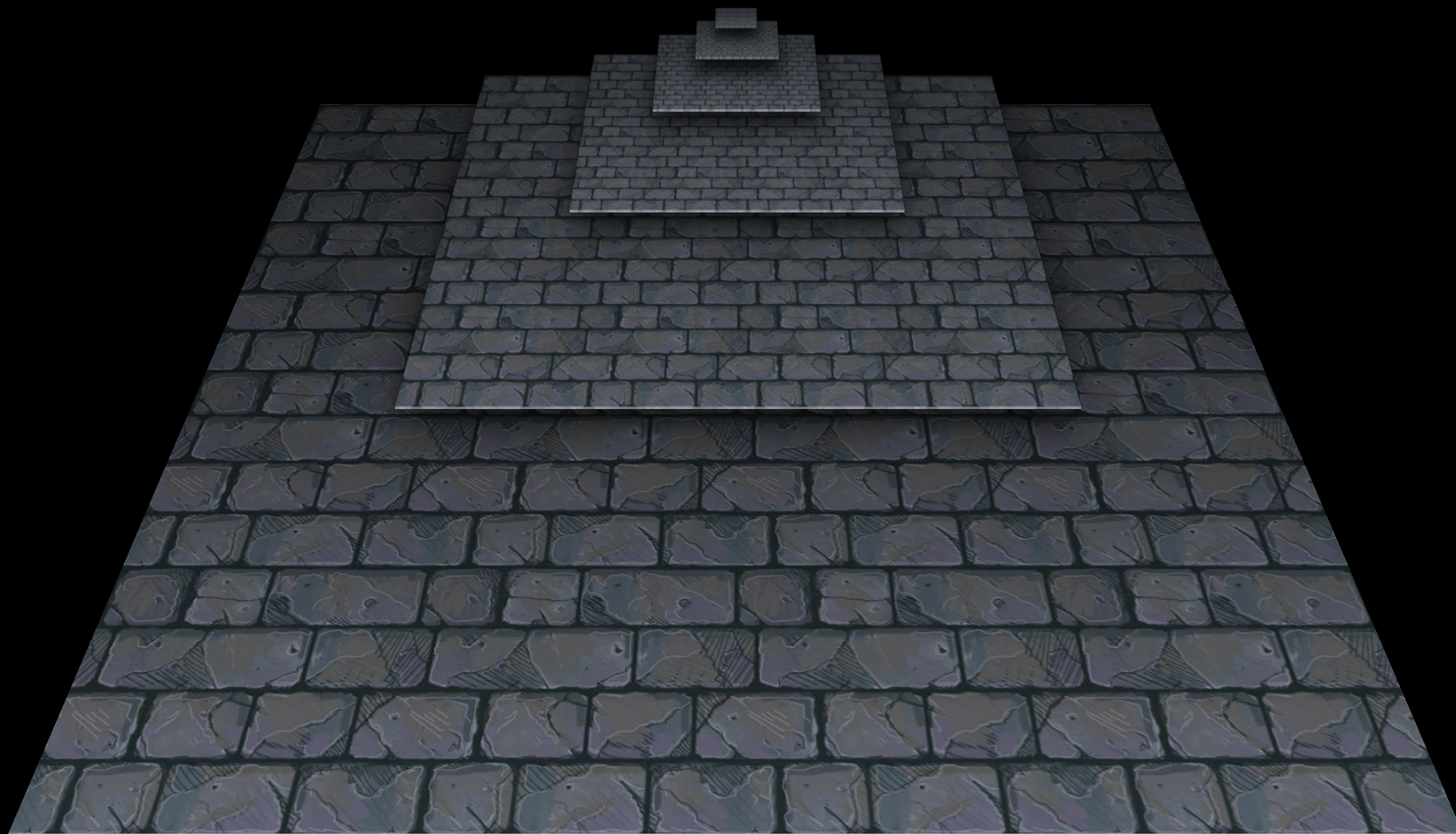


Enhanced shadows



Enhanced shadows





Advanced texturing



New texture formats



New texture formats



Optimized for performance

Demo

Horse

Torsten Reil

CEO

NaturalMotion



Full scene anti-aliasing

Enhanced shadows

Advanced texturing

New texture formats

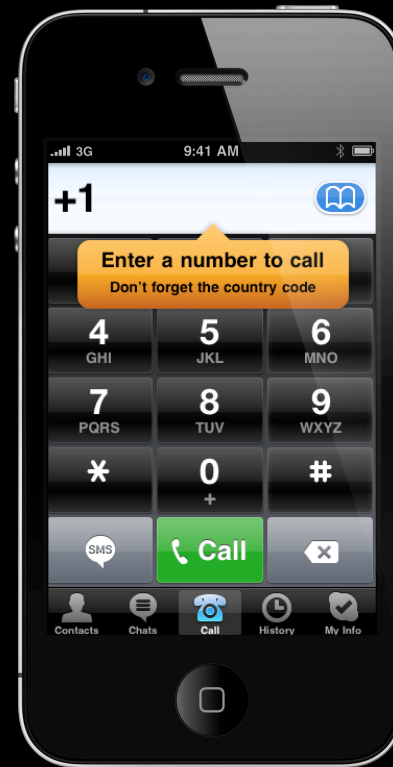
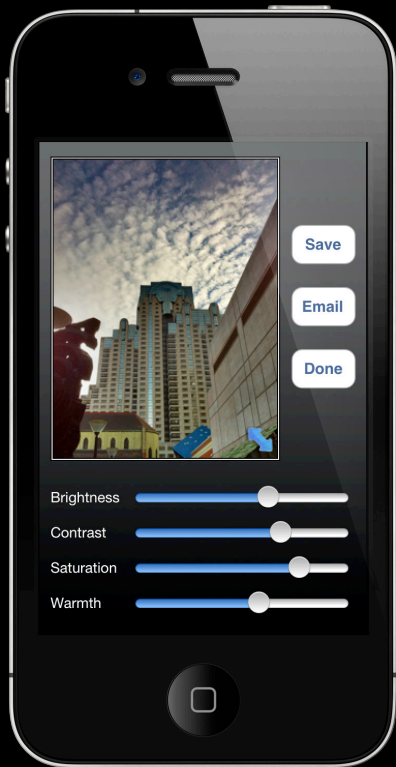
Optimized for performance

AV Foundation

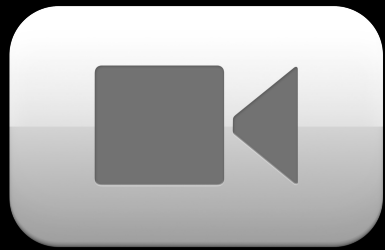
meriko borogove

Senior Manager
iPhone Technologies

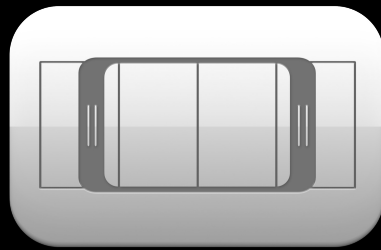




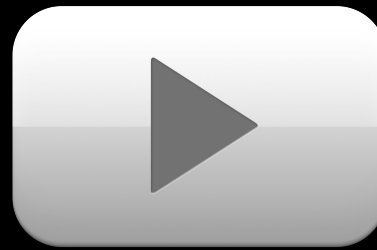




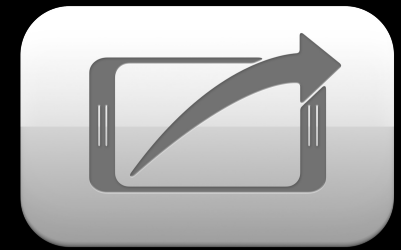
Camera



Edit



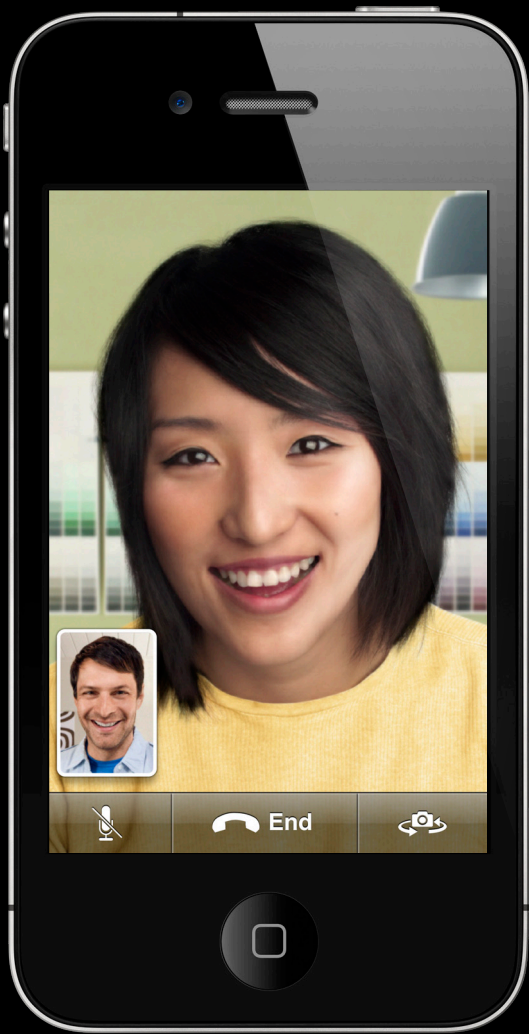
Playback



Export





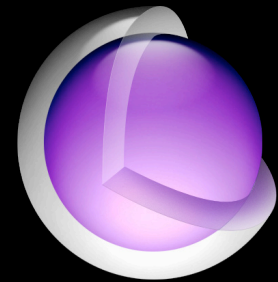






AV Foundation

OpenGL|ES™





AVCaptureVideoDataOutput

AVAsset

AVPlayer

AVPlayerItem

AVCaptureSession

AVAssetExportSession

AVSynchronizedLayer

AVCaptureVideoPreviewLayer

AVURLAsset

AVPlayerItemTrack

AVPlayerLayer

AVMutableAudioMixInputParameters

AVAssetTrackSegment

AVComposition

AVMutableMetadataItem

NSCoder AV Foundation Additions

AVCompositionTrackSegment

AVVideoCompositionInstruction

AVAssetImageGenerator

AVCaptureStillImageOutput

AVAssetTrack

AVCaptureAudioDataOutput

AVAudioPlayer

AVMutableComposition

AVAudioRecorder

AVCaptureDevice

AVMetadataItem

AVMutableCompositionTrack

AVMutableVideoComposition

AVCaptureConnection

AVAudioMix

AVMutableAudioMix

AVMutableVideoCompositionInstruction

AVMutableVideoCompositionLayerInstruction

AVCaptureInput

AVCaptureFileOutput

NSValue AV Foundation Additions

AVCaptureMovieFileOutput

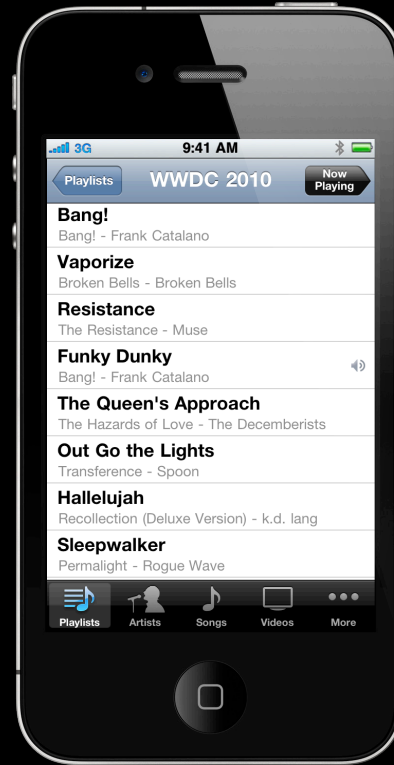
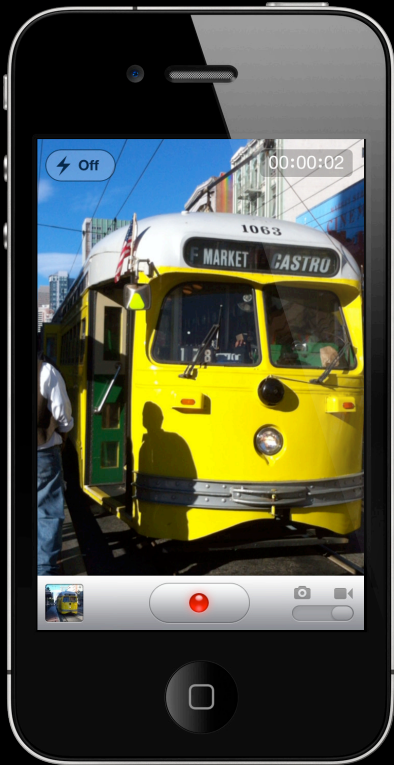
AVAudioMixInputParameters

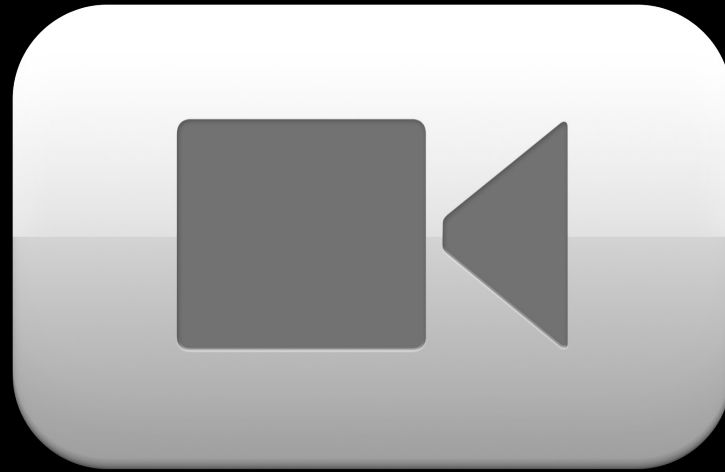
AVCompositionTrack

AVAudioSession

AVCaptureFileOutput

AVVideoComposition





Camera



Record



Control

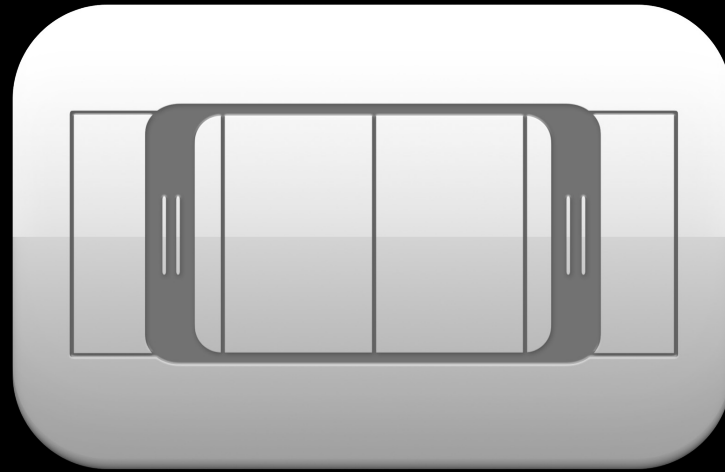


Access

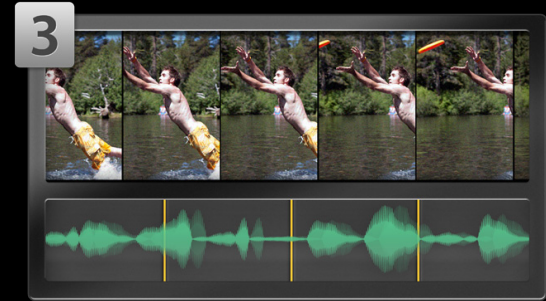
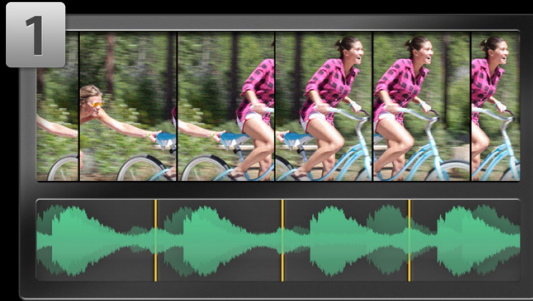


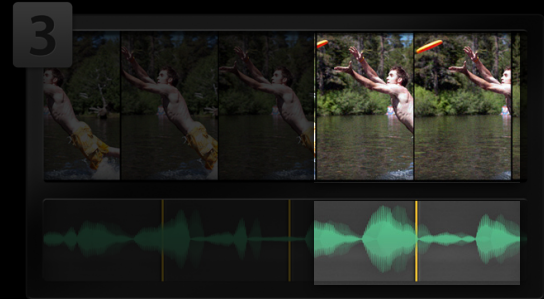
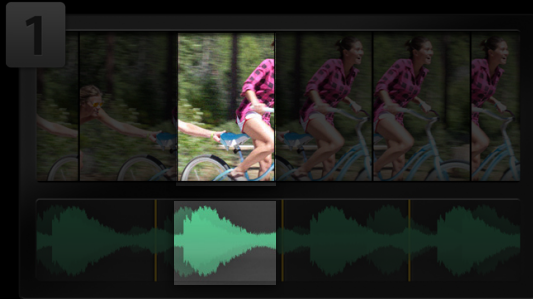
Demo

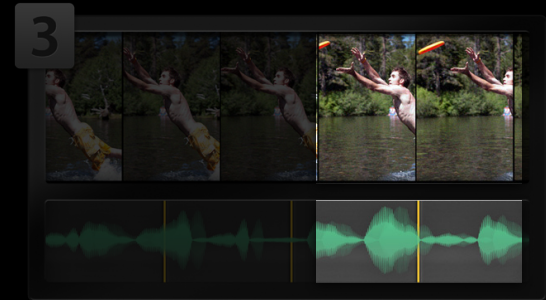
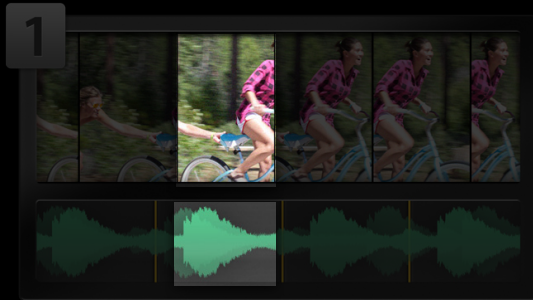
Tower



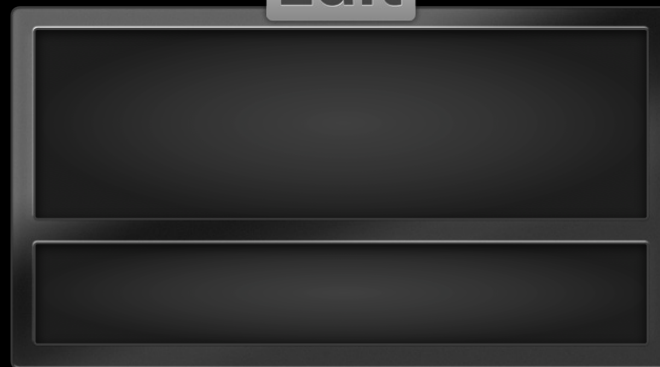
Edit



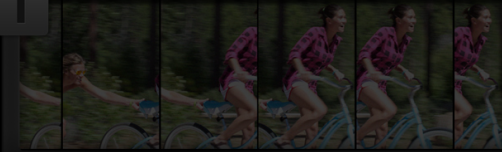




Edit



1



2

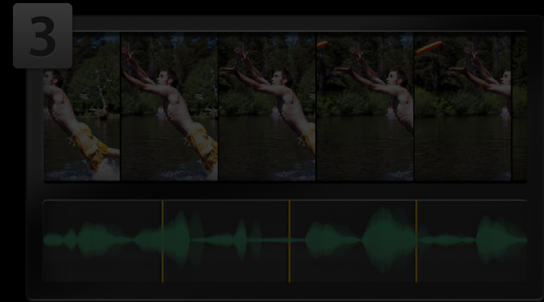
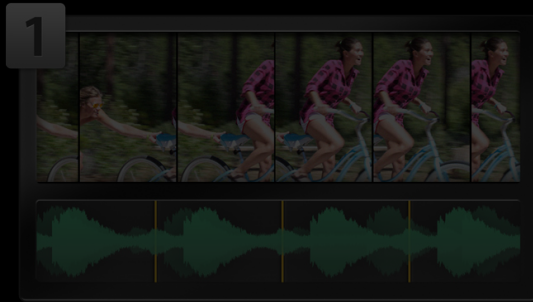


3



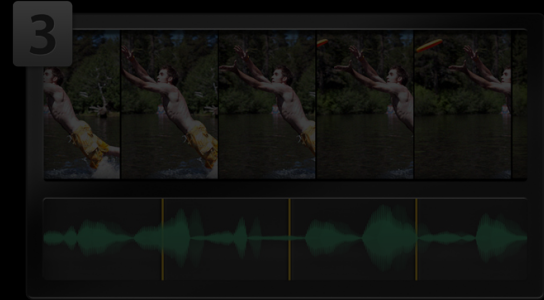
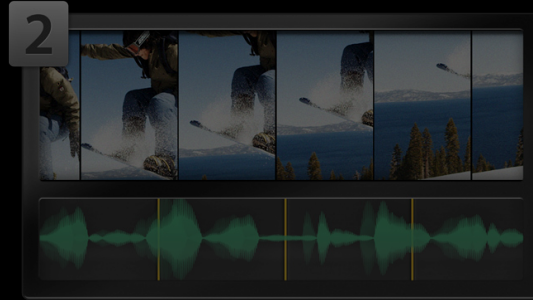
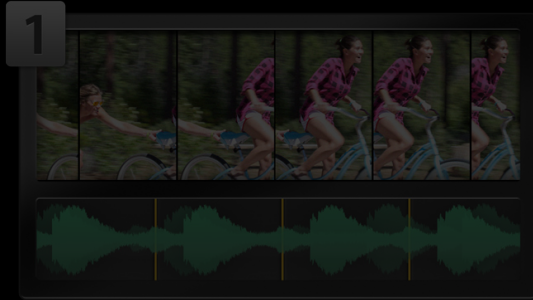
Edit





Edit

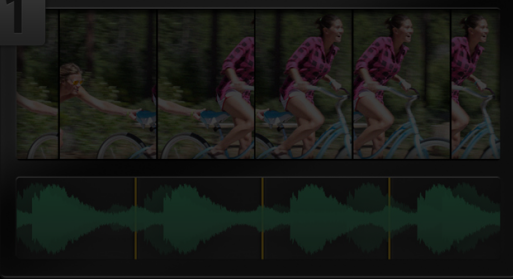




Edit



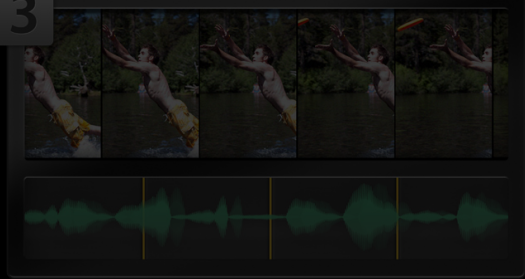
1



2



3



Edit



*California
Dreamin'*



Soundtrack

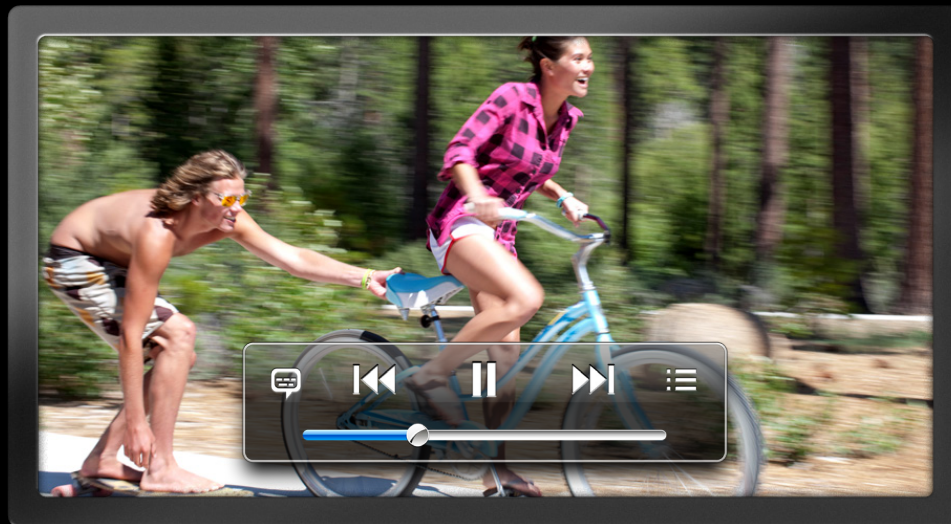


Playback





Inspection



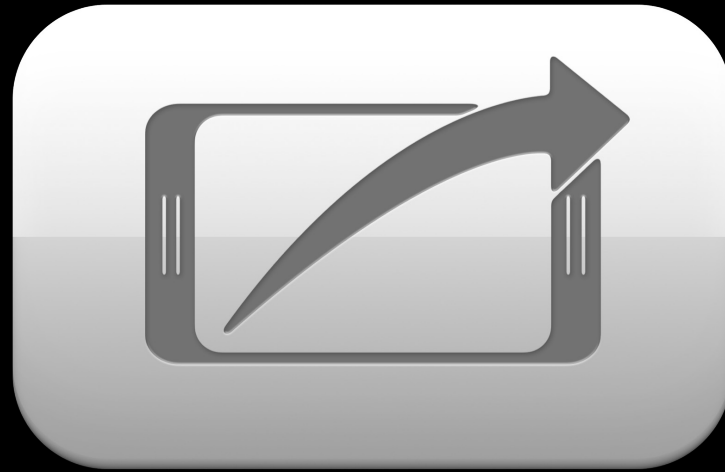
Custom controls



Synchronized layers

Demo

CoverPlay



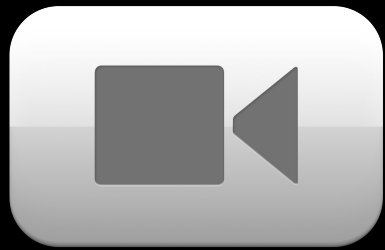
Export



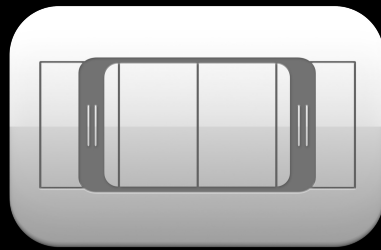
Presets



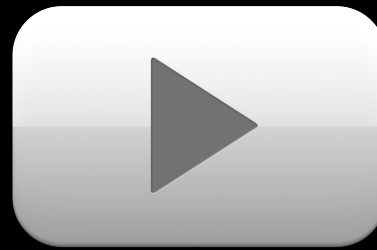
Metadata



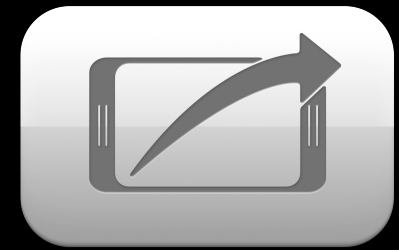
Camera



Edit



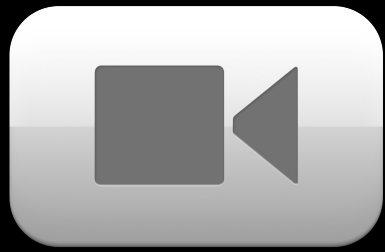
Playback



Export

Demo

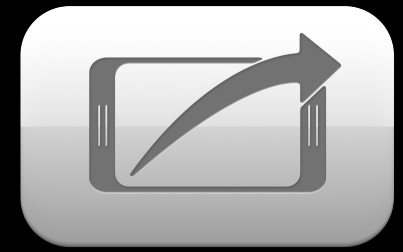
AV Foundation



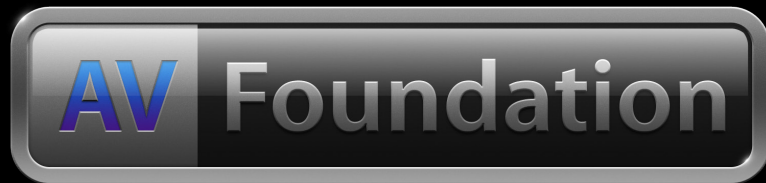
Camera



k



Export



40+ new classes

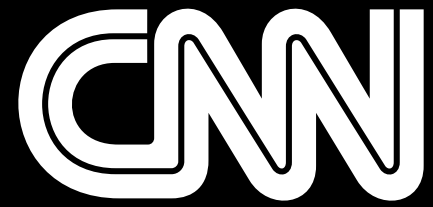
Camera

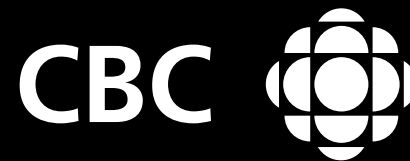
Edit

Playback

Export

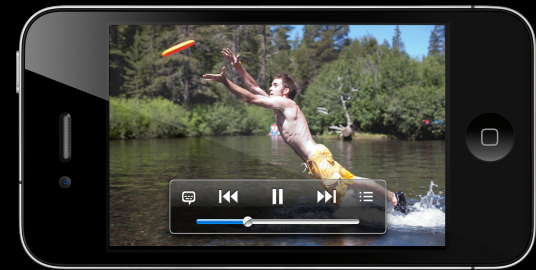
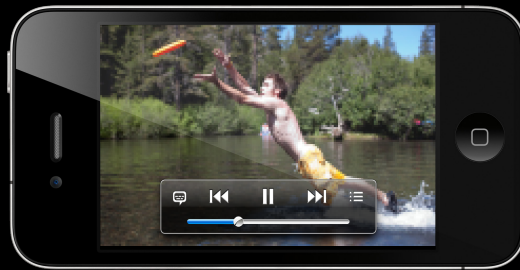
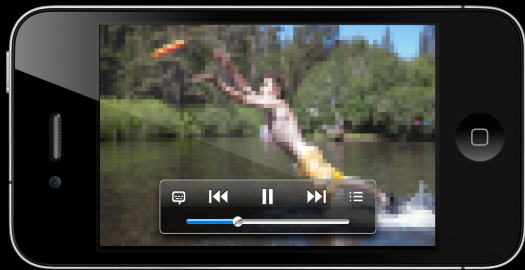
HTTP Live Streaming



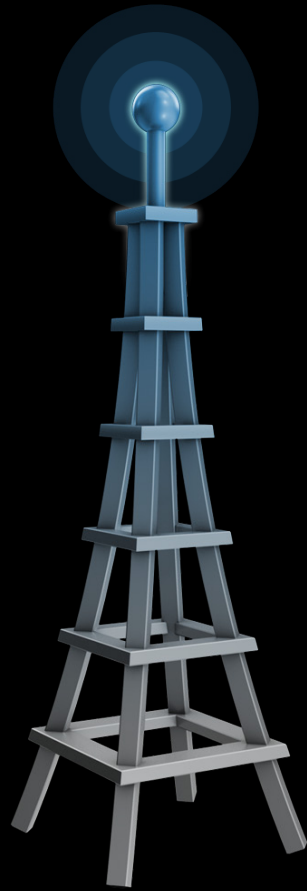




HTTP Live Streaming



Adaptive



Live



On-demand

H.264



Codecs

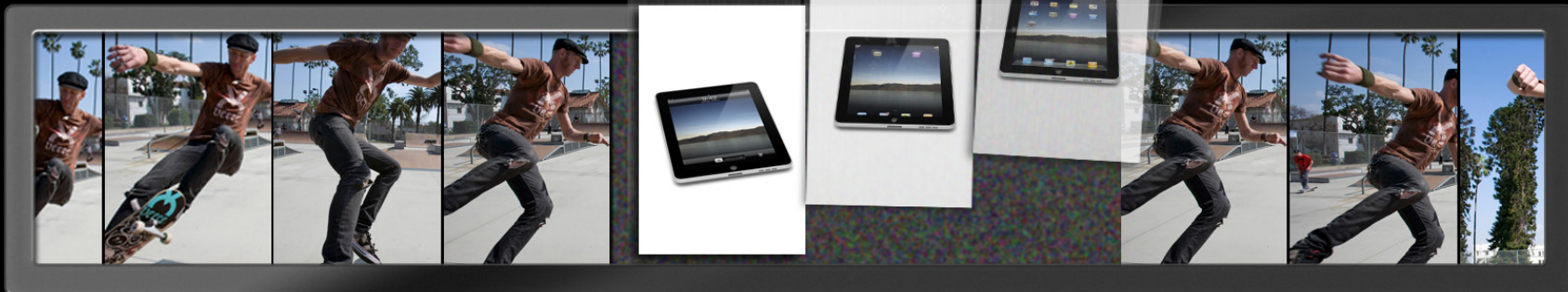


Encryption



HTTP

iOS 4



Stream insertion



Synchronized metadata



Tools

Demo

Tour de France

Matt Johnson

Partner

Engaged Sports



Stream insertion
Synchronized metadata
Tools

Game Center

Mike Lampell
iPhone Technologies

50,000

Game and Entertainment Titles on App Store

PREVIEW



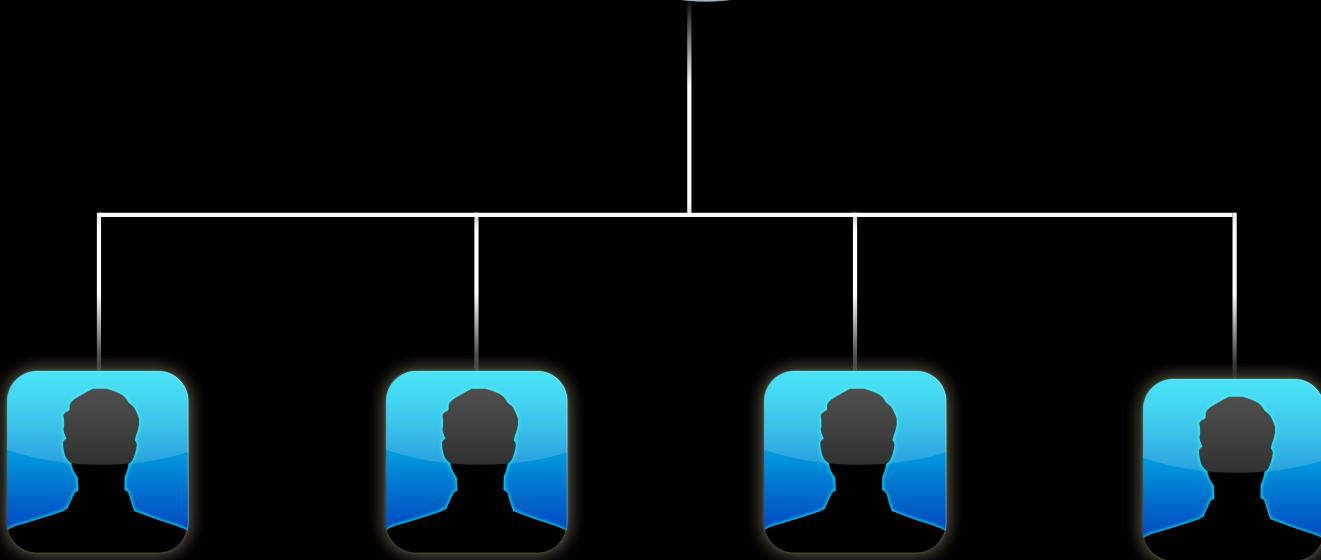
Game Center

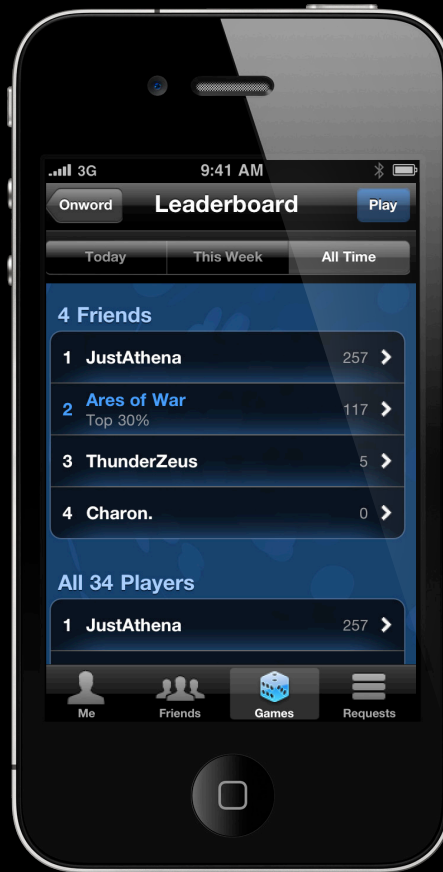


Social gaming network

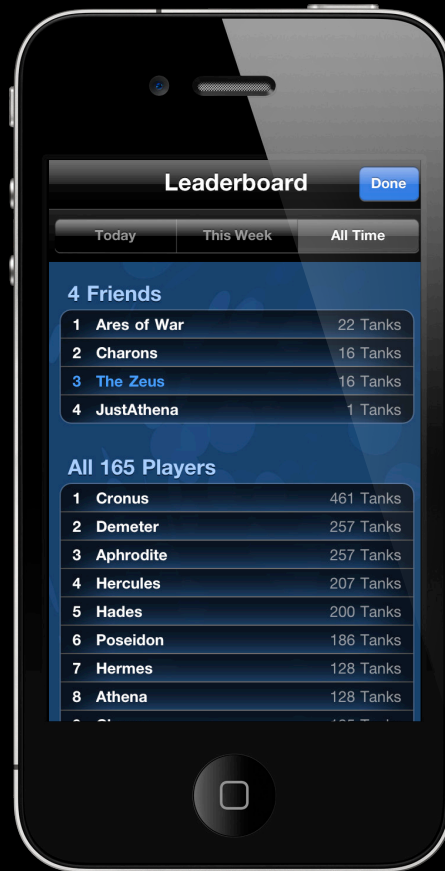


GameKit





Leaderboards



Leaderboards



Leaderboards



Achievements



Achievements



Achievements



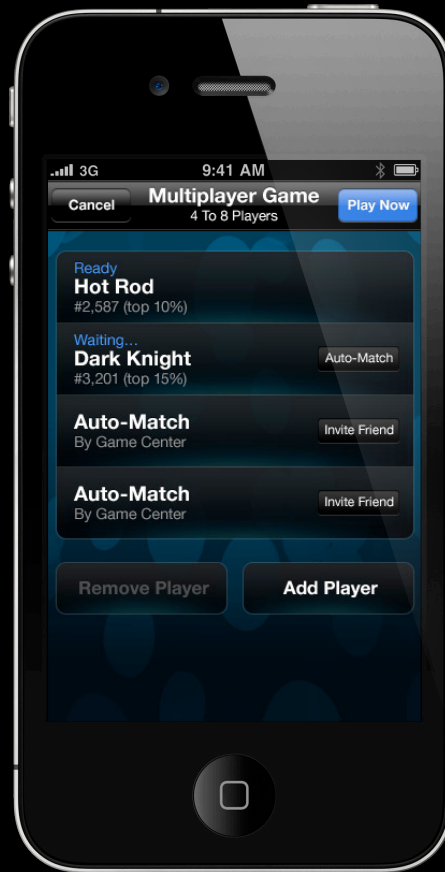
Achievements



Multiplayer



Invites

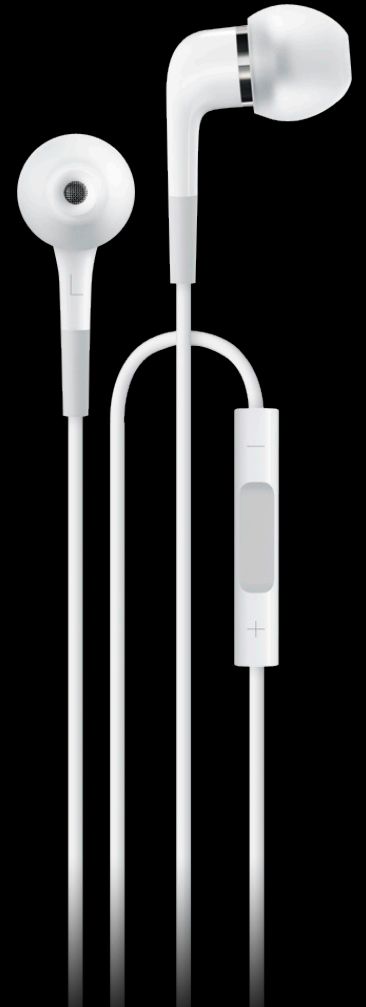


Auto-matching



Peer to peer

In-game voice chat





Leaderboards
Achievements
Invites
Auto-matching
Peer to peer
In-game voice chat

PREVIEW



Game Center



Later this year

iOS 4



OpenGL ES
AV Foundation
HTTP Live Streaming
Game Center

Demo

Quest

Graeme Devine
iPhone Game Technologies



Q 2024 releases



