

## Panframe for iOS (version 1.9.8)

### Description

Panframe is a Mindlight iOS component library offering full-spherical 360 degree movie playback and display technology. Panoramic playback can easily be integrated into existing applications.

Panframe supports VR playback of 3D/360 degree playback of stored streaming assets. Panframe supports both motion-based as well as touch-based navigation. This includes the optional use of gyroscope, compass, accelerometer and fingers where appropriate. Preliminary support for hotspot content is also included.

Panframe is offered as a universal library supporting armv7, armv7s and arm64 implementations.

Panframe comes with reference documentation and a simple to understand example. More examples are available on request upon licensing.

### Specifications/Features

#### Functionality

<b>Display modes</b>	Spherical panorama (3D) Rectangular flat view with aspect ratio (2D) Spherical panorama (3D) in side-by-side VR non-stereoscopic mode Spherical panorama (3D) in side-by-side VR stereoscopic mode (top-down formatted content)
<b>Display 3D navigation presets</b>	Touch Motion (Gyroscope <sup>1</sup> and Accelerometer+Compass <sup>2</sup> )
<b>Control Field of View in 3D</b>	Yes
<b>Control view-angle in 3D</b>	Yes, horizontal angle in motion-based preset, all angles in touch-based preset
<b>Media playback control</b>	Play, Pause, Stop and Seek
<b>Media information</b>	Playback time and duration (if available)
<b>Blindspot support in 3D</b>	None, Top and Bottom locations
<b>Hotspot support</b>	Yes, in spherical panorama display mode only (currently)
<b>User Interface customization</b>	Fully customizable
<b>Downloading of hosted assets (optional)</b>	Yes, on request

#### Asset formats and definition

<b>Supported video codecs<sup>3</sup></b>	H.264 Baseline Profile 3.0 on iPhone 3GS and iPod Touch 3 <sup>rd</sup> generation H.264 Main Profile 3.1 on iPhone 4 and iPod Touch 4 <sup>th</sup> generation H.264 Main Profile 4.1 on iPad 2, iPhone 4S or better
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<sup>1</sup> iPhone 4 and better, iPad 2 and better only

<sup>2</sup> Available in available legacy implementation

<sup>3</sup> Codecs supported on older devices are also supported on newer devices

<b>Maximum video resolution<sup>4</sup></b>	4096x2048 (iOS version and device dependent) Higher than UHD resolutions upon request and cooperation basis.
<b>Maximum video frame-rate<sup>5</sup></b>	48 fps
<b>Supported audio codecs</b>	AAC-LC up to 160 Kbps and 48 Khz
<b>Supported audio/video container formats</b>	MP4 MOV M4V HLS / M3U8 (fixed format live & vod streaming, requires iOS 6.0 and higher)
<b>Supported image formats (optional)</b>	JPEG PNG
<b>Maximum panoramic image resolution (optional)</b>	4096x2048

## OS and integration

<b>Supported iOS versions</b>	7.0 and higher (some functionality is only available in certain version and levels)
<b>Supported iOS devices</b>	iPod touch 3 <sup>rd</sup> up till 5 <sup>th</sup> generation iPhone 3GS iPhone 4 + 4S iPhone 5 + 5S iPhone 6 and 6 plus iPad iPad 2 iPad mini + retina versions (2 and 3) iPad 3 <sup>rd</sup> & 4 <sup>th</sup> generation iPad Air, iPad Air 2
<b>Binary support</b>	armv7 armv7s arm64
<b>Required iOS frameworks</b>	AVFoundation.framework CoreLocation.framework CoreGraphics.framework CoreMotion.framework CoreMedia.framework CoreVideo.framework Foundation.framework MobileCoreServices.framework OpenGLES.framework QuartzCore.framework Security.framework SystemConfiguration.framework UIKit.framework
<b>Panframe Framework library size</b>	~970 KB
<b>Typical compiled Panframe runtime size</b>	~250 KB
<b>Typical<sup>6</sup> runtime memory footprint during view &amp; playback</b>	~11 MB
<b>Typical CPU usage during operation for reference</b>	~28% CPU usage on an iPad mini ~20% CPU usage on an iPad 4

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<sup>4</sup> Format, device and/or application dependent

<sup>5</sup> Device and/or application dependent

<sup>6</sup> Using one view and one video asset when using one Full-HD asset (1920x1080) at 25 fps on an iPad mini running iOS 7.0