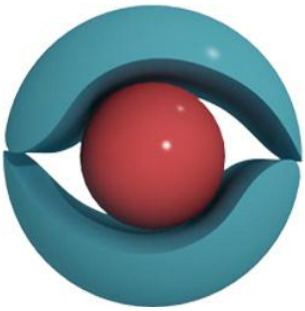
AR-media™ Player v2.3

INSTALLATION & USER GUIDE

(February, 2013)



(Mac OS X)

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Foreword

AR-media™ Player allows you to display 3D models[1] in Augmented Reality easily and quickly. No configuration required, once installed just double click an AR-media™ Resource File and enjoy. The player allows you to visualize any model in Augmented Reality and experience a totally new way to interact with digital content.

Requirements

Hardware

Minimum Hardware: 1 GHz Intel® Processor, 512 MB Ram, 100% Compliant OpenGL Video Card with 128 MB Ram, 50 MB of available Hard Disk space, USB 2.0 Webcam.

Recommended Hardware: 2 GHz Intel® Processor, 2 GB Ram, 100% Compliant OpenGL Video Card with 512 MB Ram, 50 MB of available Hard Disk space, USB 2.0 Webcam with 30FPS @ 640x480 resolution.

Software

Required Software: Mac OS X 10.5 or later.

Introduction

Augmented Reality

Augmented Reality refers to the real-time view of the physical world whose elements are augmented by computer generated items. Thanks to Augmented Reality, users can interact with 3D content directly in the environment where they live and work, by means of a suitable computer interface. Augmented Reality helps users to put any virtual content in context thus assisting them in solving real world tasks in a completely new way.

AR-media™ Platform

AR-media™ is the Augmented Reality Platform behind the line of products by Inglobe Technologies. AR-media™ is a general purpose platform for the development of advanced Augmented Reality applications and solutions. It allows to create solutions ranging from stand alone, web and mobile as well as custom solutions targeted to meet complex requirements in a wide range of applications scenarios. It supports distinct tracking techniques and software technologies that are at the basis of any Augmented Reality solution designed and deployed by Inglobe Technologies.

AR-media™ Player

The player implements only some of the features of the AR-media™ platform. No programming skills are required. Using the AR-media™ Player you can view complex and high quality Augmented Reality scenes leveraging on the main features illustrated in the Product Sheet below.

Additionally, AR-media™ Player can be used to preview content created for the ARPlayer for iOS.

[1] 3D content has to be produced by any of AR-media™ authoring tools (such as any of AR-media™ Exporters that are bundled in AR-media™ Plugin available for many digital content creation software).

	Ar-media™ Player (Standard Edition)	Ar-media™ Player (Professional Edition)**	Ar-media™ Player (Web Edition)**
Markers Library (number of markers)	N.A.	N.A.	N.A.
Multiple markers	■	■	■
Linked markers	■	■	■
Video/Audio Objects	■	■	■
Soundtracks	■	■	■
"Occluders" Objects	■	■	■
Interactions	■	■	■
Light debug Mode	■	■	N.A.
Layers' Management	■	■	N.A.
Timed Slideshow Mode	■	■	N.A.
Shadows	■	■	N.A.
Clipping/Sectioning	■	■	N.A.
Antialiasing	■	■	N.A.
Real-time Rendering	■	■	■
Real-time Animations	■	■	■
HD Support*	■	■	N.A.
Watermark	-	Customizable	Customizable

Tracking Technology	Marker Tracking	Marker and Natural Features Tracking	Marker and Natural Features Tracking
Head Mounted Displays Support	■	■	N.A.

Product Sheet

Installation

The installation procedure requires full administrative rights, so be sure to have the required privileges before trying to install the software. The installation process will install the following components:

- AR-media™ Player
- AR-media™ Configuration Utility
- Help and Documentation files
- AR-media™ Marker

The AR-media™ Player itself and accompanying utilities will be installed in the following folder:

/Applications/ARMedia/ARPlayer

while related documentation will be placed in:

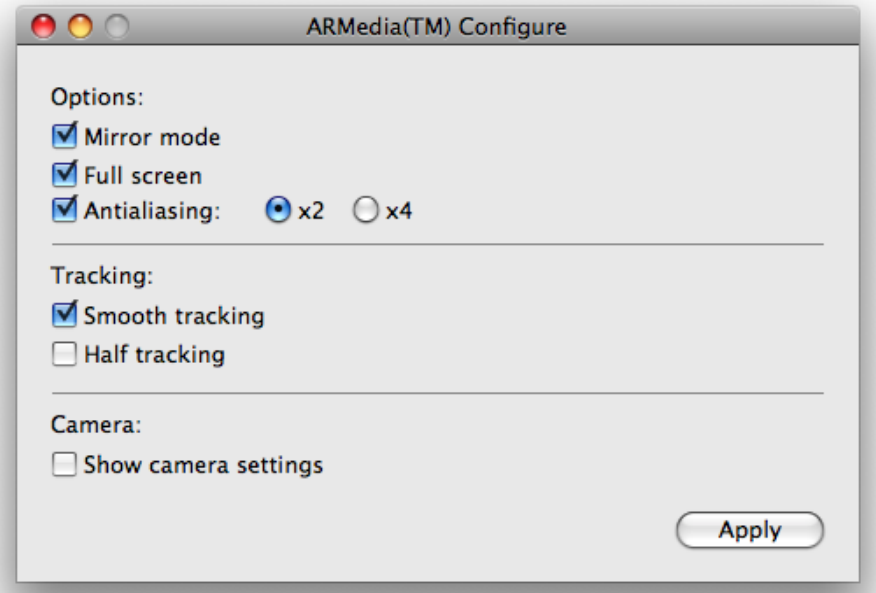
/Library/Documentation/ARMedia/ARPlayer

To start the installation process, execute the AR-media™ Player installation package and follow on screen instructions from the installation wizard. At the end of the installation process you can configure the application by running the "*Configure*" utility (please refer to the next section for configuration details).

Configuration

You can configure[2] the Player using the *Configure* utility installed with the AR-media™ software. The *Configure* utility window is shown in the following figure:

[2] Please note that you must have full administrative rights to configure the software.



In the configuration window you can choose many options each of which is described in the following section.

Configuration Options

Mirror mode: if enabled, the video stream will be horizontally flipped like in front of a mirror (this mode is suitable for cameras mounted in a fixed position and facing the user); if disabled the video stream will be not flipped (this mode is suitable for head mounted displays and in those scenarios where the user can move the camera around).

Full screen: allows to choose to run Augmented Reality in full screen or windowed mode.

Antialiasing: allows to enable antialiasing and set the corresponding value. The higher the multiplier the better your 3D models will appear but at the expense of frame rates. Video quality is not affected by this parameter.

Smooth tracking: allows to configure the tracker for using either a smooth or precise technique; if smooth tracking is enabled then objects will follow the marker in a soft manner and with a little delay, if smooth tracking is disabled then objects will be glued to the marker.

Half tracking: allows to configure the tracker for tracking a video with half the resolution of the video from the camera. This mode is useful especially when tracking high resolution images to improve the frame rate (but at the expense of a lower tracking quality).

Show camera settings: allows to adjust camera's parameters before starting the Augmented Reality experience.

When you click the *Apply* button any change you've made will be applied.

Usage

Printing Markers

To experience Augmented Reality with AR-media™ Player you'll need to print one or more markers and possibly fix them on a rigid, flat surface. You can print the provided AR-media™ marker by opening the following file available for printing:

/Library/Documentation/ARMedia/ARPlayer/Marker.pdf

NOTE: custom markers must be provided by the author of the specific .armedia file you want to visualize.

Supported Models

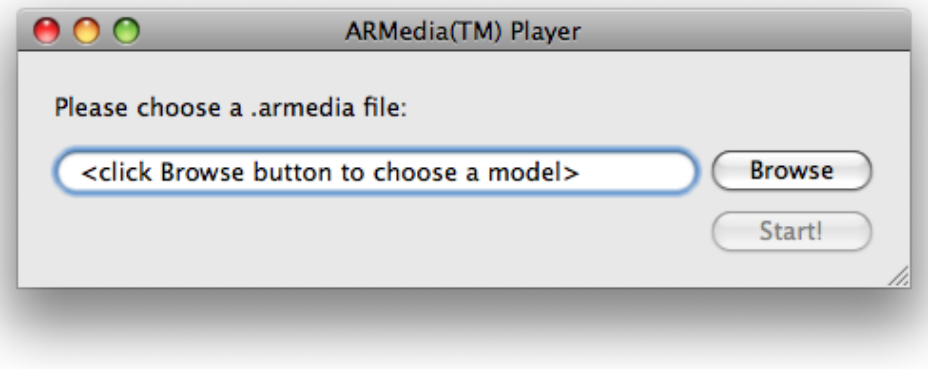
The AR-media™ Player allows you to display AR-media™ models in Augmented Reality, such kind of models have the .armedia file extension. You can get AR-media™ models in two ways:

1. by creating models by means of tools provided by AR-media™ platform
2. by receiving models created by third parties by means of AR-media™ platform

The AR-media™ platform includes authoring tools and utilities for the creation of files suitable for the player, such tools may be any of the AR-media™ Exporters that are bundled in Professional editions of AR-media™ Plugin available for most digital content creation software.

Execution

In order to execute the AR-media™ Player you can double click any .armedia file or you can launch the player's application from the AR-media™ Player installation folder. In the latter case a window that allows you to select your models will be displayed (see below).



During execution point your camera toward the marker to visualize your 3D content on it.

NOTE: custom markers must be provided by the author of the specific .armedia file you want to visualize.

Interactions

During the viewer execution, you can switch between different management modalities using the function keys: each one permits you to adjust different parameters and interact with the AR scene in real-time. You can bring up an on-screen help which contains all the supported commands for the current active mode by hitting the 'h' key at any time.

The following sections will offer a brief description of each mode and then a summary table of all supported commands.

Visualization Management Mode

This mode permits you to adjust the visualization parameters regardless of AR content that will be displayed. All operations performed in this mode will affect the global scene and all the 3D objects.

This mode is especially useful when you want to adjust to different camera and monitor configurations like in-built webcams and projectors (which are sometimes set up to flip the image output vertically).

Note that this is the initial mode in which the Viewer will be every time is started.

Object/Scene Interaction Mode

This mode permits you to configure the global scene with respect to the markers. This mode is useful for demonstration reasons, to quickly change the global display of a model in real-time.

In fact, you can scale the whole model up or down to emphasize the details of 3D objects.

You can also highlight (reveal) occluder objects to quickly adjust them into the real environment.

Animation Management Mode

This mode permits you to interact with the animations of each object in the scene.

You can manage all 3D objects' animations by incrementing their speed or stopping them.

Note that this mode will not affect the video texture playback of Video Objects. However, you can interact with them as discussed in the previous sections of this guide.

Sound Management Mode

This mode permits you to interact with the soundtrack which has been previously configured.

You can cycle between selected tracks or pause/restore the audio playback in real-time in order to smoothly adapt to different scenarios.

Layers/Sequences Management Mode

This mode permits you to manage layers and timed slideshows. You can switch between two different modes:

- *Layers:* this is the "classic" display mode, in which all layers are visible at the same time. You can then toggle layers' visibility by using the respective numbers' keys.
- *Sequence:* this mode displays each layer for a selected amount of time, then it hides the current layer and displays the next one. You can pause/restore this "slideshow" visualization by simply hitting the Spacebar.

Note that if you did not manually set specific layers for your 3D objects, they will be automatically placed in the base layer (the 0 layer). In this situation you can hide/show the whole model by hitting the '0' key.

Clipping/Sectioning Management Mode

This mode permits you to show and interact with the clipping planes of the 3D objects in the scene to perform real-time sectioning. By sectioning your models you can look inside them and interactively move the section as you wish. Note that in order to start the sectioning command one and only one marker must be visible because clipping planes are bound to the currently visible marker (the default position of these planes are placed on the faces of a cube whose bottom face is over the marker and whose side is 80.0 units wide).

Note: in order to perform all the actions described below, clipping/sectioning must be 'enabled' by using the corresponding key (refer to the table below for details).

Tracking Management Mode

This mode permits you to adjust some parameters that will help you to improve tracking performances.

For instance, modifying the lighting threshold will allow you to recognize the marker even in bad lighting conditions (too dark or too lit environments) and it is useful if used in combination with the lighting debug mode (see below for details).

You can also modify the tracking smoothness factor: this parameter is what modifies the way 3D objects follow the marker movements on the screen.

A low factor will make 3D objects appear to have "inertia": they will tend to remain to their position despite marker movements. This is useful when the marker is not moved much and in a slow way during the Augmented Reality visualization, so the objects will appear more stable and especially in those cases when you experience jittering because of bad lighting conditions.

Instead, a high factor will make 3D objects strictly follow the marker movements. Remember that a very high factor will magnify all the little movements of the markers (even the ones that are due to the camera adjustments to the lighting conditions), so it may result in 3D objects which appear unstable.

Lighting Management Mode

This mode permits to manage the light source eventually available in the AR scene and the shadows casted and received by the 3D objects.

You can freely move and rotate the light source in the 3D space during the Augmented Reality visualization in order to display different light configurations.

Since shadows are computed in real-time, there are two accuracy modatilities available:

- *Fastest accuracy:* this mode permits to gain more speed during the shadows calculation and display. This may result in a more responsive interaction with the model, especially in older computers' configurations.
- *Highest accuracy*[3]*:* this mode permits to have a better shadows' visualization, at the cost of more processing power.

You can also switch between two shadows mode:

- *Simple shadows:* this mode displays shadows as they are calculated from the 3D environment. This mode results in edgy and precise shadows, just like the ones that comes from a direct light.

Soft shadows: this mode will soften the shadows' edges. Please note that since this mode requires more processing power than the other one, you may want to switch to the 'Fastest' shadows visualization's accuracy to obtain good performances.

Note: this mode is only available when a light which cast shadows is available in the AR scene.

Commands and Interactions' Summary

The following table summarizes all the keys' interactions available during the Augmented Reality visualization.

[3] Please note that some textures may not be displayed in the desired way if this mode is active.

Description	*Key*
Visualization Management	Fn + F1
flip the video horizontally	← or →
flip the video vertically	↓ or ↑
toggle fullscreen visualization ON and OFF	F
toggle wireframe visualization ON and OFF	W
Object/Scene Interaction	Fn + F2
scale up the model	S
scale down the model	Shift + S
Take back a full-screen video playback on the corresponding 'Video Object' (this behavior can be also achieved by clicking anywhere on the screen while the video playback is in full-screen). Hitting the key again will restore the full-screen playback, but only if a corresponding resign_fullscreen action on the same 'Video Object' had not been issued in the meanwhile.	F or Shift + F
toggle Occluder objects' highlighting	O
Animation Management	Fn + F3
decrease the animations' speed	← or →
increase the animations' speed	↓ or ↑
rewind the animations	←
toggle the animations ON and OFF	↵
reset the animations' default speed	0
Sound Management	Fn + F4

start the previous track	← or →
start the next track	↓ or ↑
rewind the soundtrack	←
toggle the soundtrack playback ON and OFF	↵
Layers/Sequence Management	Fn + F5
show the previous layer	← or →
show the next layer	↓ or ↑
switch between the layer/sequence mode	↵
pause the sequence visualization	space
show all layers	⬆ Shift + U
hide all layers	U
toggle respective layer visibility	0 … 9
Clipping/Sectioning Management	Fn + F6
move clipping plane away from the marker	↓
rotate clipping plane clockwise with respect to the marker	←
rotate clipping plane counter-clockwise with respect to the marker	→
move clipping plane towards the marker	↑
disable Clipping mode	←
show all clipping planes	space
enable Clipping mode	↵

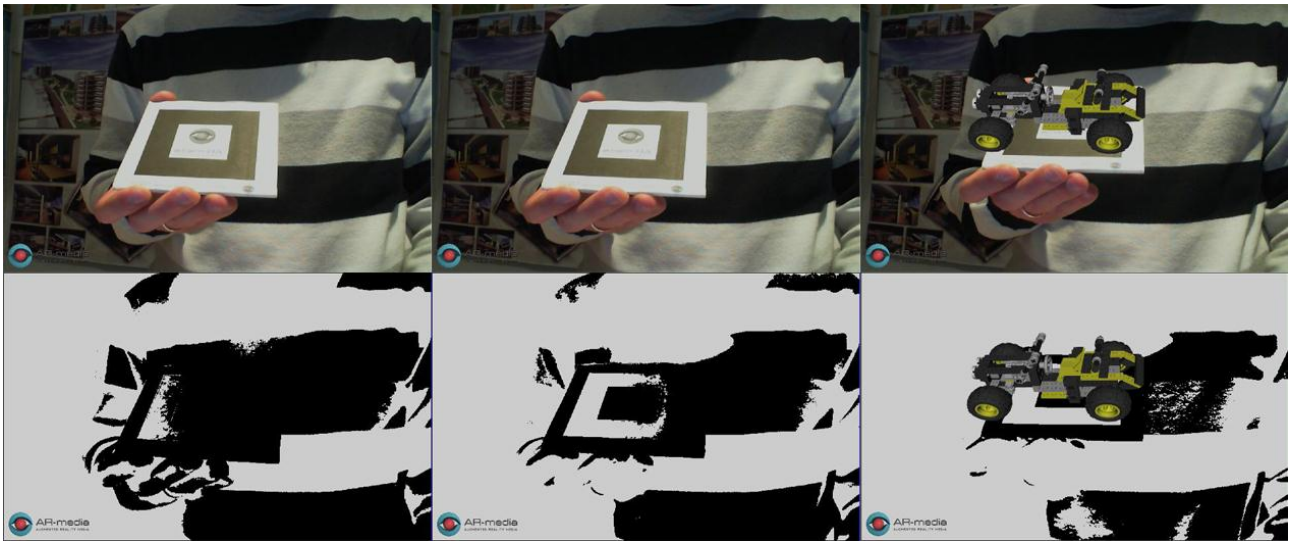
activate respective clipping plane	1 … 6
show respective clipping plane	⌘ Cmd + 1 … 6
select respective clipping plane	Ctrl + 1 … 6
activate all clipping planes	A
deactivate all clipping planes	N
select clipping plane of a 3D object	
Tracking Management	Fn + F7
increase lighting threshold	→ or +
decrease lighting threshold	← or −
increase smoothing parameter (increase objects' stickiness to the marker)	↑ or ⬆ Shift + A
decrease smoothing parameter (decrease objects' stickiness to the marker)	↓ or A
toggle lighting debug mode	D
reset lighting threshold	space or 0
Lighting Management Mode	Fn + F8
Move light source left	←
Move light source right	→
Move light source forward	↑
Move light source backwards	↓
Move light source up	Ctrl + ↑
Move light source down	Ctrl + ↓

Toggle light source visibility	space
Rotate light source around its local X axis	Q and A
Rotate light source around its local Y axis	W and S
Rotate light source around its local Z axis	E and D
Set shadow mode to 'Simple'	Ctrl + 1
Set shadow mode to 'Soft'	Ctrl + 2
Set visual accuracy to 'Fastest'	⌘ Cmd + 1
Set visual accuracy to 'Highest'	⌘ Cmd + 2
Show only shadows (only for 'Highest' accuracy mode)	Ctrl + 0
Show shadows and textures (only for 'Highest' accuracy mode)	⌘ Cmd + 0
On-screen help	H
Terminate the execution	Esc

NOTES: (a) to avoid using the "Fn" key in addition to the Function keys, you must go into the *"System Preferences -> Keyboard"* menu and check the *"Use all F1, F2, ..., F12 keys as standard function keys"* box. **(b)** If you have the *"Spaces"* active, pressing the CTRL keys will result in using the *"Spaces"* application and not in activating the chosen mode, you should either temporary disable "*Spaces*" or configure different keys.

Lighting Debug Mode

Lighting debug mode allows you to adjust parameters in order to track markers even in bad lighting condition. By entering the "Tracking Management Mode" and then hitting the 'd' key the video will turn into black & white showing you the way the software 'sees' reality and in particular how the printed marker is seen. In order to have a good tracking or even to just have your models appear on markers, they must be clearly detected, if they are not then you can use the '+' or '-' keys in order to improve detection.



Lighting debug mode in action.

In the above image, the upper row shows the video from the camera and the lower row shows the video in 'lighting debug mode'. From left to right you can see how, at the beginning, some reflections on the right side of the marker make it appear almost black in lighting debug mode and so it is not detected and the model doesn't appear; when you hit '+' several times the situation improves and the marker becomes clear and the model is displayed as well; by hitting the 'd' key again you exit from the lighting debug mode. When you have darker scenes you can use the '-' key instead of '+'. Note that even though the black & white image changes as you use the '+' or '-' keys, the original video doesn't change.

Customizations

A customization service is available in order to tailor the AR-media™ Player's features to fit your needs. Please contact our team for details: business@inglobetechnologies.com.

Licensing

The AR-media™ Player is available for free but in no cases it can be used for commercial purposes or included in any other product. For details refer to the accompanying license file. You can also refer to the Inglobe Technologies licensing service through the following email address: licensing@inglobetechnologies.com.

Support

For any problem or question you can write to: help@inglobetechnologies.com.