
CAMediaTimingFunction Class Reference

Graphics & Animation: Animation





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CAMediaTimingFunction Class Reference

Inherits from	NSObject
Conforms to	NSCoding NSObject (NSObject)
Framework	/System/Library/Frameworks/QuartzCore.framework
Availability	Available in iOS 2.0 and later.
Declared in	CAMediaTimingFunction.h
Companion guides	Core Animation Programming Guide Core Animation Cookbook

Overview

`CAMediaTimingFunction` represents one segment of a function that defines the pacing of an animation as a timing curve. The function maps an input time normalized to the range [0,1] to an output time also in the range [0,1].

Tasks

Creating Timing Functions

- + `functionWithName:` (page 6)
Creates and returns a new instance of `CAMediaTimingFunction` configured with the predefined timing function specified by *name*.
- + `functionWithControlPoints:::::` (page 6)
Creates and returns a new instance of `CAMediaTimingFunction` timing function modeled as a cubic Bézier curve using the specified control points.
- `initWithControlPoints:::::` (page 7)
Returns an initialized timing function modeled as a cubic Bézier curve using the specified control points.

Accessing the Control Points

- [getControlPointAtIndex:values:](#) (page 7)
Returns the control point for the specified index.

Class Methods

functionWithControlPoints::::

Creates and returns a new instance of `CAMediaTimingFunction` timing function modeled as a cubic Bézier curve using the specified control points.

```
+ (id)functionWithControlPoints:(float)c1x
    :(float)c1y
    :(float)c2x
    :(float)c2y
```

Parameters

c1x

A floating point number representing the x position of the c1 control point.

c1y

A floating point number representing the y position of the c1 control point.

c2x

A floating point number representing the x position of the c2 control point.

c2y

A floating point number representing the y position of the c2 control point.

Return Value

A new instance of `CAMediaTimingFunction` with the timing function specified by the provided control points.

Discussion

The end points of the Bézier curve are automatically set to (0.0,0.0) and (1.0,1.0). The control points defining the Bézier curve are: [(0.0,0.0), (*c1x*,*c1y*), (*c2x*,*c2y*), (1.0,1.0)].

Availability

Available in iOS 2.0 and later.

Declared In

`CAMediaTimingFunction.h`

functionWithName:

Creates and returns a new instance of `CAMediaTimingFunction` configured with the predefined timing function specified by *name*.

```
+ (id)functionWithName:(NSString *)name
```

Parameters*name*

The timing function to use as specified in “[Predefined timing functions](#)” (page 8).

Return Value

A new instance of `CAMediaTimingFunction` with the timing function specified by *name*.

Availability

Available in iOS 2.0 and later.

Declared In

`CAMediaTimingFunction.h`

Instance Methods

getControlPointAtIndex:values:

Returns the control point for the specified index.

```
- (void)getControlPointAtIndex:(size_t)index values:(float)ptr
```

Parameters*index*

An integer specifying the index of the control point to return.

ptr

A pointer to an array that, upon return, will contain the x and y values of the specified point.

Discussion

The value of *index* must be between 0 and 3.

Availability

Available in iOS 2.0 and later.

Declared In

`CAMediaTimingFunction.h`

initWithControlPoints:::::

Returns an initialized timing function modeled as a cubic Bézier curve using the specified control points.

```
- (id)initWithControlPoints:(float)c1x
    :(float)c1y
    :(float)c2x
    :(float)c2y
```

Parameters*c1x*

A floating point number representing the x position of the c1 control point.

c1y

A floating point number representing the y position of the c1 control point.

`c2x`

A floating point number representing the x position of the c2 control point.

`c2y`

A floating point number representing the y position of the c2 control point.

Return Value

An instance of `CAMediaTimingFunction` with the timing function specified by the provided control points.

Discussion

The end points of the Bézier curve are automatically set to (0.0,0.0) and (1.0,1.0). The control points defining the Bézier curve are: [(0.0,0.0), (*c1x*,*c1y*), (*c2x*,*c2y*), (1.0,1.0)].

Availability

Available in iOS 2.0 and later.

Declared In

`CAMediaTimingFunction.h`

Constants

Predefined Timing Functions

These constants are used to specify one of the predefined timing functions used by [functionWithName:](#) (page 6).

```
NSString * const kCAMediaTimingFunctionLinear;
NSString * const kCAMediaTimingFunctionEaseIn;
NSString * const kCAMediaTimingFunctionEaseOut;
NSString * const kCAMediaTimingFunctionEaseInEaseOut;
NSString * const kCAMediaTimingFunctionDefault;
```

Constants

`kCAMediaTimingFunctionLinear`

Specifies linear pacing. Linear pacing causes an animation to occur evenly over its duration.

Available in iOS 2.0 and later.

Declared in `CAMediaTimingFunction.h`.

`kCAMediaTimingFunctionEaseIn`

Specifies ease-in pacing. Ease-in pacing causes the animation to begin slowly, and then speed up as it progresses.

Available in iOS 2.0 and later.

Declared in `CAMediaTimingFunction.h`.

`kCAMediaTimingFunctionEaseOut`

Specifies ease-out pacing. An ease-out pacing causes the animation to begin quickly, and then slow as it completes.

Available in iOS 2.0 and later.

Declared in `CAMediaTimingFunction.h`.

`kCAMediaTimingFunctionEaseInEaseOut`

Specifies ease-in ease-out pacing. An ease-in ease-out animation begins slowly, accelerates through the middle of its duration, and then slows again before completing.

Available in iOS 2.0 and later.

Declared in `CAMediaTimingFunction.h`.

`kCAMediaTimingFunctionDefault`

Specifies the timing function used as the default by most animations. It approximates a Bézier timing function using the control points [(0.0,0.0), (0.25,0.1), (0.25,0.1), (1.0,1.0)]. By using this constant you ensure that your animations will use the current default timing.

Available in iOS 3.0 and later.

Declared in `CAMediaTimingFunction.h`.

Document Revision History

This table describes the changes to *CAAnimationTimingFunction Class Reference*.

Date	Notes
2009-11-17	Corrected typos.
2009-03-09	Updated for iOS 3.0. Added new constant for default timing function.
2008-07-11	Corrected descriptions of the predefined timing functions.
2007-07-24	New document that describes the class that encapsulates the pacing of an animation as a timing curve.

REVISION HISTORY

Document Revision History