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# CAMediaTimingFunction Class Reference

[Graphics & Imaging](#) > Quartz



2008-07-11



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# CAMediaTimingFunction Class Reference

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<b>Inherits from</b>	NSObject
<b>Conforms to</b>	NSCoding NSObject (NSObject)
<b>Framework</b>	/System/Library/Frameworks/QuartzCore.framework
<b>Availability</b>	Available in Mac OS X v10.5 and later.
<b>Declared in</b>	CAMediaTimingFunction.h
<b>Companion guides</b>	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 bezier curve using the specified control points.
- `initWithControlPoints:::::` (page 7)  
Returns an initialized timing function modeled as a cubic bezier 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 bezier 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 bezier curve are automatically set to (0.0,0.0) and (1.0,1.0). The control points defining the bezier curve are: [(0.0,0.0), (*c1x*,*c1y*), (*c2x*,*c2y*), (1.0,1.0)].

#### Availability

Available in Mac OS X v10.5 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 Mac OS X v10.5 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[2])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 Mac OS X v10.5 and later.

**Declared In**

`CAMediaTimingFunction.h`

### **initWithControlPoints:::::**

Returns an initialized timing function modeled as a cubic bezier 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 bezier curve are automatically set to (0.0,0.0) and (1.0,1.0). The control points defining the bezier curve are: [(0.0,0.0), (*c1x*,*c1y*), (*c2x*,*c2y*), (1.0,1.0)].

**Availability**

Available in Mac OS X v10.5 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;
```

**Constants**

`kCAMediaTimingFunctionLinear`

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

Available in Mac OS X v10.5 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 Mac OS X v10.5 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 Mac OS X v10.5 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 Mac OS X v10.5 and later.

Declared in `CAMediaTimingFunction.h`.

**Declared In**

`CAMediaTimingFunction.h`



# Document Revision History

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

Date	Notes
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**

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