

Game Design on the iPhone

“Alien Splat - cracking
open the code!”



Who is this guy?



- It's about Winning!!!
- I've got Tiger Blood!!!
- I'm tired of pretending my life isn't perfect and bitch'n!!!

Who is this guy?



- Software Engineer
- iOS Apps



Agenda

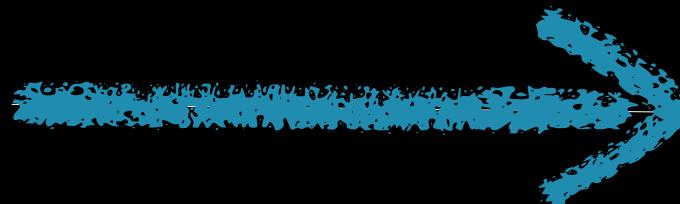
- Alien Splat History 101
- Architecture of Alien Splat
- A Closer Look at the Use of Audio
- Graphics - Manipulating Views
- The Switch to Game Center
- Lessons Learned



Alien Splat History 101



2009



2011

Alien Splat History 101

- First appeared in the App Store on September 9th, 2009
- Highest Rank was #91 for Top 100 Paid Games
- New and Noteworthy by Apple on September 16th, 2009
- Five weeks to build



Alien Splat History 101

- What is Alien Splat?
 - Simple Wack-A-Mole style game
 - 75 Levels and 7 Boss Levels
 - Paid and Free (Lite) Version
 - Universal App
 - Built to learn more about iPhone OS (iOS)





Alien Splat

- Demo How to Play Alien Splat App



Architecture of Alien Splat



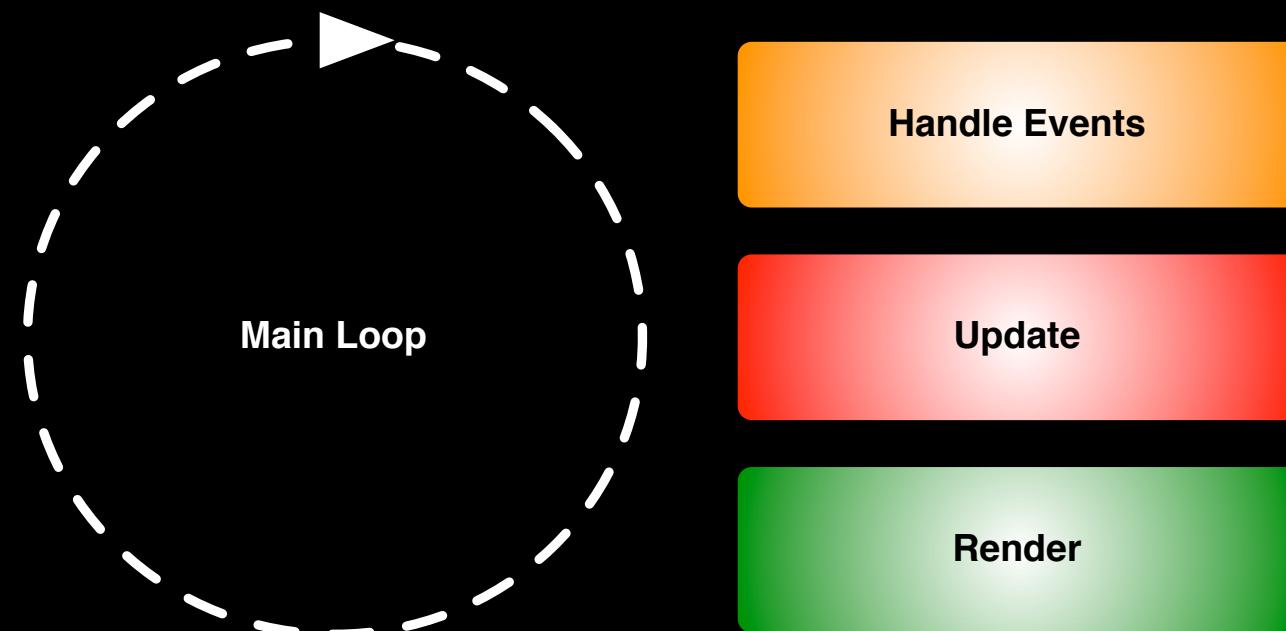
Design



App Store

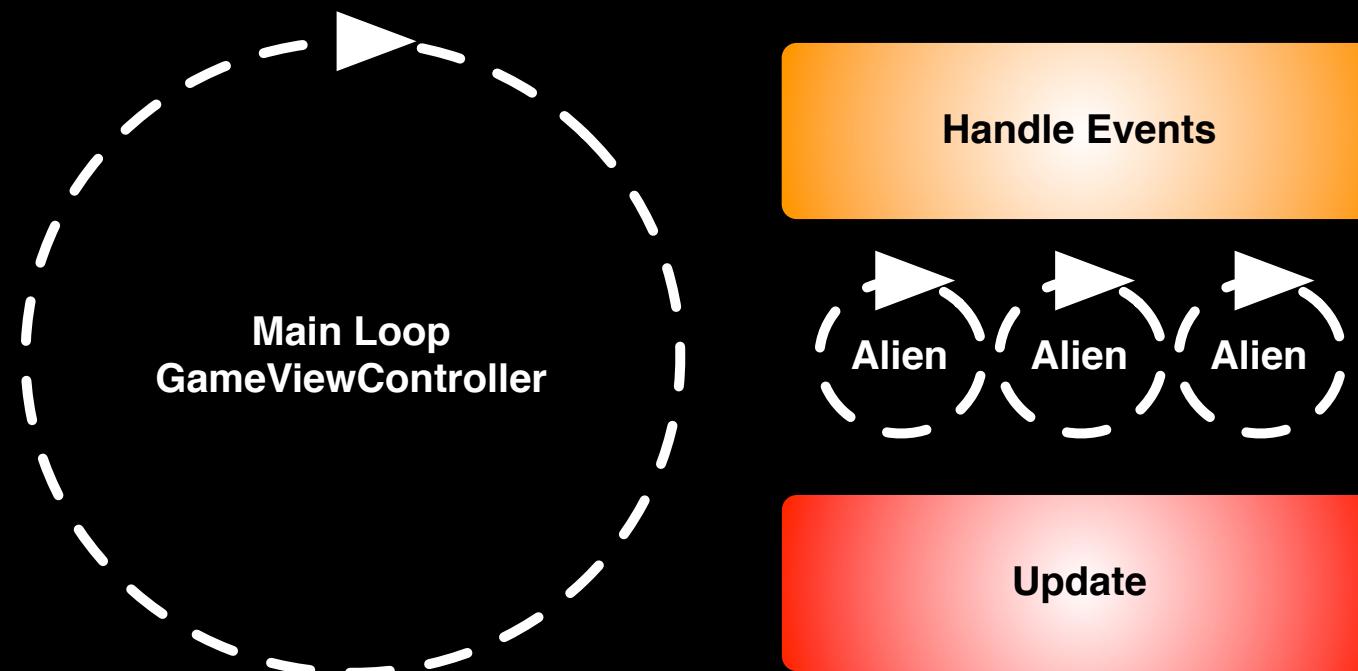
Typical Architecture

Typical Game Loop

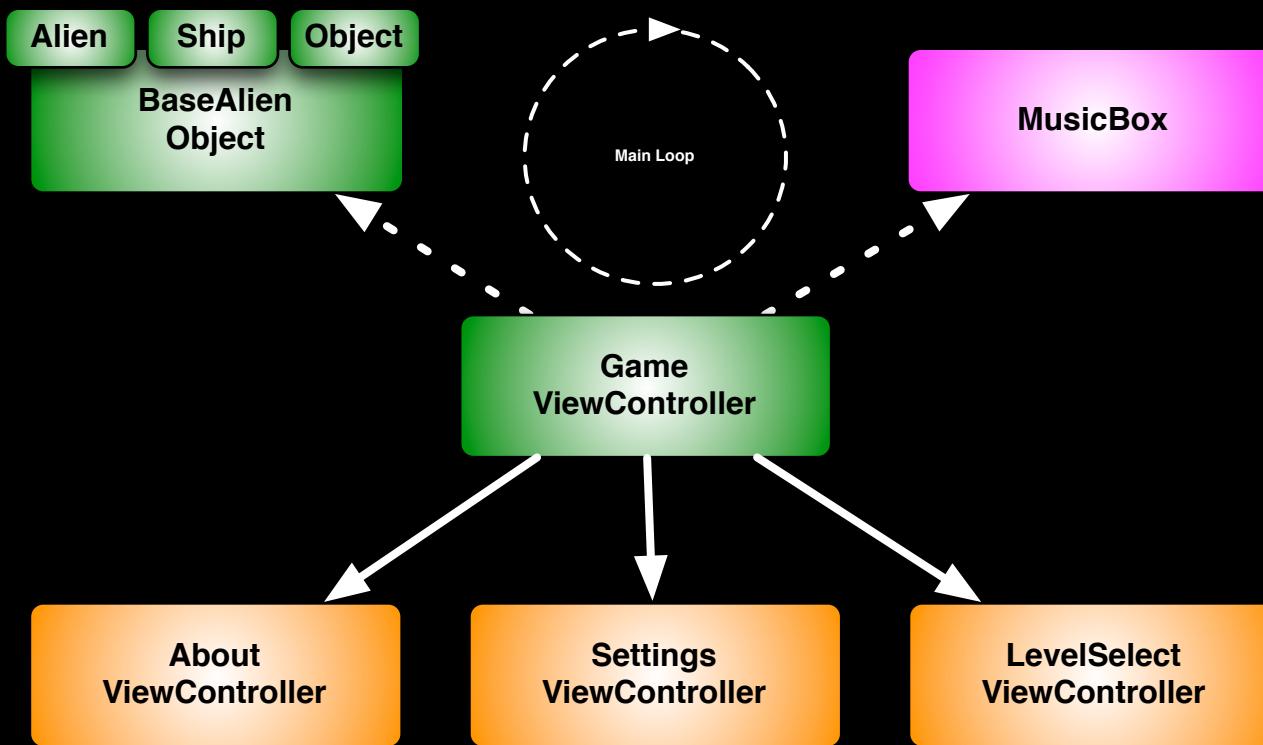


Splat Architecture

Alien Splat Game Loop



Class Breakdown



Singletons

Configuration

LevelMapping

AppAnalytics

GameViewController

```
#import <UIKit/UIKit.h>
#import <QuartzCore/QuartzCore.h>
#import <GameKit/GameKit.h>
#import <iAd/iAd.h>
#import <AudioToolbox/AudioServices.h>
#import "MusicBox.h"
#import "AwardViewController.h"

@class BaseAlienObject;

@interface GameViewController : UIViewController
<UIAlertViewDelegate,
GKLeaderboardViewControllerDelegate,
GKAchievementViewControllerDelegate,
ADBannerViewDelegate> { ... }

@property BOOL animating;
@property BOOL playMode;
@property BOOL userWasPlaying;
@property int currentLevel;
@property int currentScore;
@property (nonatomic, retain) UIPopoverController *pop;
@property BOOL bannerIsVisible;

- (IBAction)addNewAlien:(id)sender;
- (IBAction)removeLastAlien:(id)sender;
- (IBAction)changeAnimation:(id)sender;
- (IBAction)clearAllAliens:(id)sender;
- (IBAction)showSettings:(id)sender;
- (IBAction)showAbout:(id)sender;
- (IBAction)showLevelSelect:(id)sender;

- (BaseAlienObject*)addAlienObject:(NSString*)className;
- (BaseAlienObject*)addAlienObject:(NSString*)className withX:(int)xCoord andY:(int)yCoord;
- (void)addScore:(int)score;
- (void)playSound:(SoundTags)tag;

- (IBAction)playNow:(id)sender;
- (void)startNewLevel:(int)level;
- (IBAction)requestGameStop:(id)sender;
- (IBAction)animateShowHideView:(id)sender;

- (void)authenticateLocalPlayer;
- (IBAction)showLeaderBoard:(id)sender;
- (IBAction)showAchievements:(id)sender;

- (IBAction)removeAds:(id)sender;
- (void)showProApp;

- (IBAction)tapMissed:(id)sender;
- (IBAction)doubleTap:(id)sender;

@end
```

BaseAlienObject Interface

```
#import <UIKit/UIKit.h>
#import <AudioToolbox/AudioServices.h>
#import "Configuration.h"

#define RANDOM_ALIEN_OBJECT      @"RandomObject"

@interface BaseAlienObject : UIControl { ... }

@property (nonatomic,readonly) Boolean animating;
@property (nonatomic,readonly) Boolean deleteMe;
@property (nonatomic,readonly) int tapCount;
@property (nonatomic,readonly) SystemSoundID
tapSound;
@property (nonatomic,assign) id parentView;
@property (nonatomic,retain) UIImageView *image;

// Methods to Overwrite
- (void)configureObject;
- (void)objectTapped;

// Public Configuration Methods
- (void)setBounceX:(BOOL)xCoord
    andBounceY:(BOOL)yCoord;
- (void)setShouldRotate:(BOOL)rotate;
- (void)setRandomBouncing:(BOOL)random;
- (void)setTapCount:(int)count;
- (void)setLifeCount:(int)count;
- (void)setImageName:(NSString*)imgStr;
- (void)setTapSound:(SystemSoundID)sysSoundID;
- (void)setScoreValue:(int)score;
- (void)setChangeDirectionPercent:(int)percent;

// Public Use Methods
- (void)setX:(int)xCoord setY:(int)yCoord;
- (void)setPlayingGame:(BOOL)isPlaying;
- (void)startAnimation:(BOOL)shouldAnimate;
- (void)addNewObject:(NSString*)className;
- (SystemSoundID)createSystemSound:(SystemSoundID)
soundID withFile:(id)fileNamePath;
- (void)destroyObject;

@end
```

Configuration Interface

```
#import <Foundation/Foundation.h>

@interface Configuration : NSObject { ... }

typedef enum {
    JDM_iPod = 0,
    JDM_iPhone = 1,
    JDM_iPad = 2,
} JDM_Devices;

@property (readonly) BOOL ballSound;
@property (readonly) BOOL musicSound;
@property (readonly) BOOL lastLevel;
@property (readonly) BOOL vibrate;
@property (readonly) int gameLevel;
@property (readonly) int numBalls;
@property (readonly) int objectType;
@property (readonly) int lastLevelPlayed;
@property (readonly) int stateScore;
@property (readonly) int stateLevel;
@property (readonly) int stateMisses;
@property (readonly) BOOL stateActive;
@property (readonly) BOOL cheatMode;
@property (readonly) int hs_novice;
@property (readonly) int hs_expert;
@property (readonly) int hs_insane;
@property (readonly) int highestLevel;

+ (id) instance;
- (BOOL)isProVersion;
- (void)setBallSound:(BOOL)use;
- (void)setMusicSound:(BOOL)use;
- (void)setLastLevel:(BOOL)use;
- (void)setVibrate:(BOOL)use;
- (void)setGameLevel:(int)num;
- (void)setNumBalls:(int)num;
- (void)setObjectType:(int)num;
- (void)setLastLevelPlayed:(int)num;
- (void)setStateScore:(int)num;
- (void)setStateLevel:(int)num;
- (void)setStateMisses:(int)num;
- (void)setStateActive:(BOOL)use;
- (void)setCheatMode:(BOOL)use;
- (JDM_Devices)getDeviceType;
- (void)setHighestLevel:(int)num;
- (int)getHighScore;
- (BOOL)setHighScore:(int)score;
- (NSString*)getGameCenterCategory;

@end
```

LevelMapping Interface

```
#import <Foundation/Foundation.h>

@interface LevelMapping : NSObject {
}

+ (id) instance;

- (NSArray*)getLevel:(int)num;

@end
```



A Closer Look at the Use of Audio

Audio



- MusicBox class
 - Controls Background Music
 - Controls Sound Effects
- Creating sounds is easy (Sound Studio)

MusicBox Interface

```
#import <Foundation/Foundation.h>
#import <AudioToolbox/AudioServices.h>
#import <AVFoundation/AVFoundation.h>

typedef enum {
    SOUND_WELCOME = 1,
    SOUND_STARTLEVEL,
    SOUND_BOSSLEVEL,
    SOUND_LEVELCOMPLETED,
    SOUND_LEVELFAILED,
    SOUND_BEEP,
    SOUND_SHIP_DESTROYED,
    SOUND_BOSS_DESTROYED,
    SOUND_YOU_MISSED,
} SoundTags;

@interface MusicBox : NSObject <AVAudioPlayerDelegate> { ... }

- (void)startMusic;
- (void)stopMusic;
- (void)changeSong;

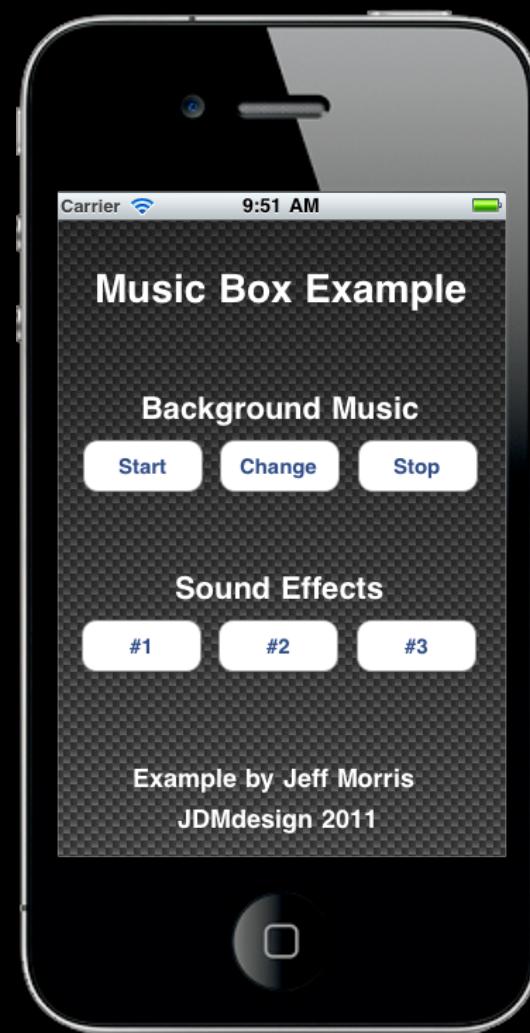
- (void)playSound:(SoundTags)tag;

@end
```



Audio

- Demo Audio App



Graphics - Manipulating Views

Graphics

- Eye Candy Helps

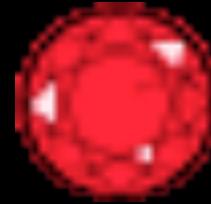
- Icon



- Aliens



- Gems



Graphics

- Retina Display Graphics
 - Double the size of any image
 - $100 \times 100 = 200 \times 200$
 - Just add the @2x at the end of any image
 - background.png = background@2x.png

Manipulating Views

- Rotate a view

```
// Create a timer somewhere in your code
[NSTimer scheduledTimerWithTimeInterval:0.05
    target:self
    selector:@selector(timerLoop)
    userInfo:nil
    repeats:YES];

- (void)timerLoop {
    rotateCount++;
    if (rotateCount>16) rotateCount = 1;
    viewInstance.transform =
        CGAffineTransformMakeRotation((3.14159265/8)*rotateCount);
}
```

Manipulating Views

- Move a view

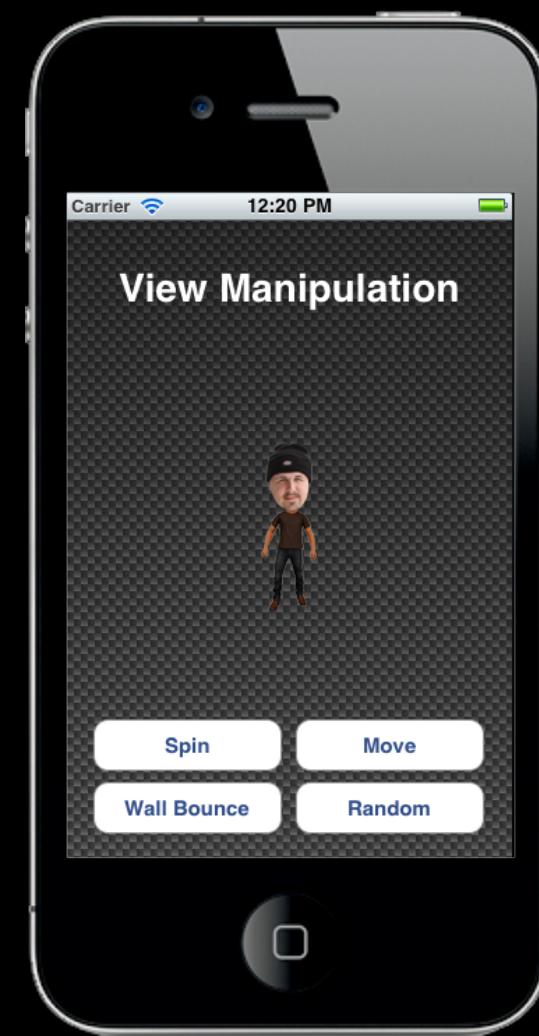
```
// Create a timer somewhere in your code
[NSTimer scheduledTimerWithTimeInterval:0.05
                                    target:self
                                      selector:@selector(timerLoop)
                                        userInfo:nil
                                       repeats:YES];

- (void)timerLoop {
    self.imgView.center =
        CGPointMake(viewInstance.center.x+5,
                    viewInstance.center.y+10);

    // Check if the view is out of bounds
    ...
}
```

View Manipulation

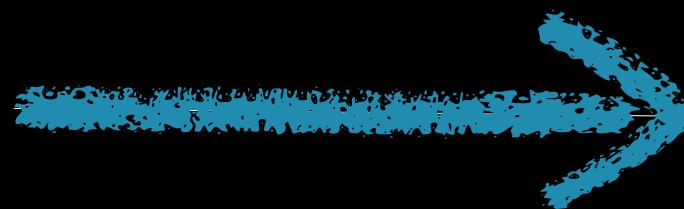
- Demo View Manipulation App



The Switch to Game Center



AGON



GameCenter



Game Center

- What is GameCenter?
- Leader Boards
- Achievements
- Multiplayer
- In-Game Voice Chat
- Why GameCenter?



Lessons Learned

Lessons Learned #1

- Don't Reinvent the Wheel
 - Learn about Game Cycles First
 - Implement a known pattern

Lessons Learned #2

- Refactor, Refactor, Refactor!
 - Refactored the MusicBox class
 - Refactored the BaseAlienObject class
 - Refactored the LevelMapping class
 - Refactored the About/Help views

Lessons Learned #3

- View based games have limits!
 - Alien Splat has a limit of 10 objects on the screen at one time
 - Created a queue to hold other objects

Lessons Learned #4

- Ride the wave!!!
 - Be prepared for a wild ride
 - Advertisement helps moves everything
 - YouTube Reviews
 - Promo Codes - Use them!

Lessons Learned #99

- Easter Eggs



Question and Answers

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