

iOS Development Joining the Unicorn Hunt

Forrest Heller
Weird Space Adventures

How much \$ did you make?

- Really asking: Should I listen to what you say? Should I get begin developing apps?
- Response: I made enough to make a living. App Store is risky--many devs making nothing. If you have a family, don't quit your day job.

What is all this Apple iStuff?

Apple released a series of devices that use the same OS, which Apple calls “iOS”. This used to be called “iPhone OS”

iOS Devices

- All use touch screens for user interaction
- All have a same base set of programs (Calendar, Contacts, music player (iPod))
- All work with iTunes
- **Allow third party developers to sell compiled code via the “App Store” which is part of iTunes**

App Store

- Apple manually approves all apps
- Apple takes 30% of revenue
- Updates are free to users
- Users can rate your application
- Users can post reviews about your application
- I haven't found a way to contact users from iTunes reviews

iOS Devices on which customers can purchase your applications



iPad

“Large” Tablet thing



iPhone

Phone



iPod Touch

Music Player

How do I write applications?

- Use Apple's IDE called XCode and UI builder tool called Interface Builder
- Use Objective-C++ which is a superset of the following:
 - C
 - C++
 - **Objective-C <== primary**

Targeting multiple devices

- A single app can target `_all_` devices
- Uses a “Universal Binary”
- Sometimes an app is iPad only
 - Convention is to add an HD suffix
 - Example: KittyCats HD

I want to get started without spending any \$

- Without spending any money, **you can only build and run applications in a simulator that runs on your computer (MIGHT BE WRONG)**. The simulator has limited capabilities and your code will compile to X86
- YOU NEED AN INTEL MAC WITH SNOW LEOPARD!
- <http://developer.apple.com/library/ios/navigation/index.html?section=Resource+Types&topic=Getting+Started>

I can spend \$100 on my iOS habit

- That gets you a developer license which allows you to compile applications and run/debug them on your iOS device
- You can test your application on up to 100 devices
- Strict control of application installation through “provisioning” (will be covered in Apple documentation)

I don't care about
selling apps I just want
to run code on my iOS
device

- Talk to the jailbreaking community
- They have a gcc-based toolchain

Are you an iPhone power-user?

- If not, you need to get an iPhone buddy
- Mine is Ryan Gibbons
- Ryan was instrumental in equipment loaning and telling me what iPhone is all about (I really didn't get it)
- Lots of success owed to Ryan

Once you finished your application

- Submit it to Apple for review
- Used to take a week or two to review-- now only takes a couple of days
- They will call your house if they find a problem
- I didn't have much trouble

How do I beta test with strangers?

- You want an Ad Hoc distribution profile
- You get the tester's device UUID (apps for this exist)
- You go to the "Provisioning Portal" website
- Add the tester's UUID to the Ad Hoc profile
- Give the user the Ad Hoc profile and the App
- ALWAYS TEST WITH AN AD HOC DISTRIBUTION PROFILE BEFORE RELEASE
- Automate the build process as much as possible!
- If at first you don't succeed, just keep following the instructions over and over

In App Purchases

- No idea how this works
- Audience members?

Getting a feel: Hardware

- Currently, the hardware for iOS devices is mix and match

http://en.wikipedia.org/wiki/List_of_iOS_devices

	Older 1st generation iPod Touch iPhone 1 + iPhone 3G	Newer (iPad + everything else)	Comparison
CPU (ARM based) Pipelined with in-	ARMv6 instruction set ARM claims 600-1200 DMIPS (depends on processor used)	ARMv7 instruction set ARM claims 2.0 DMIPS/MHz (2000 for iPad) Contains NEON SIMD! (WHOO!)	http://www.roylongbottom.org.uk/dhrystone%20results.htm Pentium III = 1505 DMIPS
GPU	Power MBX Fixed function OpenGL ES 1.1 Pipeline	Power SGX 535 OpenGL 2.0 ES (compiled fragment and vertex shader support)	John Carmack (of id Software fame) claims these graphics cards rival fourth-gen consoles (Xbox, Gamecube, PS II)
DRAM	128-256 MB	256-512 MB	My Mac Mini has 2 GB of RAM Playstation 2 has 32 MB of RAM

Getting a feel:software

- iOS is a heavily customized Mac OS X, which itself is the XNU Kernel with **FreeBSD**
- Apple provides lots of libraries, mainly using Objective-C
- DEMO TIME -- making an app!

A note

- Learn about the Autorelease pool--although I recommend avoiding the Autorelease pool when possible (It introduces a lot of non-determinism into memory management)

My app: TrippingFest

- Summer of 2009
- Borrowed a friend's iPhone for a week
- Borrowed another friend's mom's Macbook Pro w/ Mac OS X Leopard (Intel chipset) for a week
- Note: Apple forces developers to upgrade constantly

Released it as a paid app

- \$1.00 USD

FAIL

- Didn't even cover cost of development license

Decided to make it free

- All my other computer programs that are worth releasing have been released for free at <http://www.forrestheller.com>
- Why not TrippingFest?
- \$100? Who cares?

**And then I found the
Unicorn! It's the iTunes
Top 100 lists!**

iTunes App Store

- Has Top 100 apps in every category (Entertainment, Medicine, Games, etc.)
- Has a Top 100 overall list
- Ranked by number of downloads--rating has nothing to do with it (as far as we know...)

iTunes App Store

- Each country has separate app store and **app rankings**

LIBRARY





















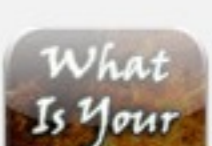
- Music
- Movies
- TV Shows
- Podcasts
- Radio

STORE

iTunes Store

PLAYLISTS

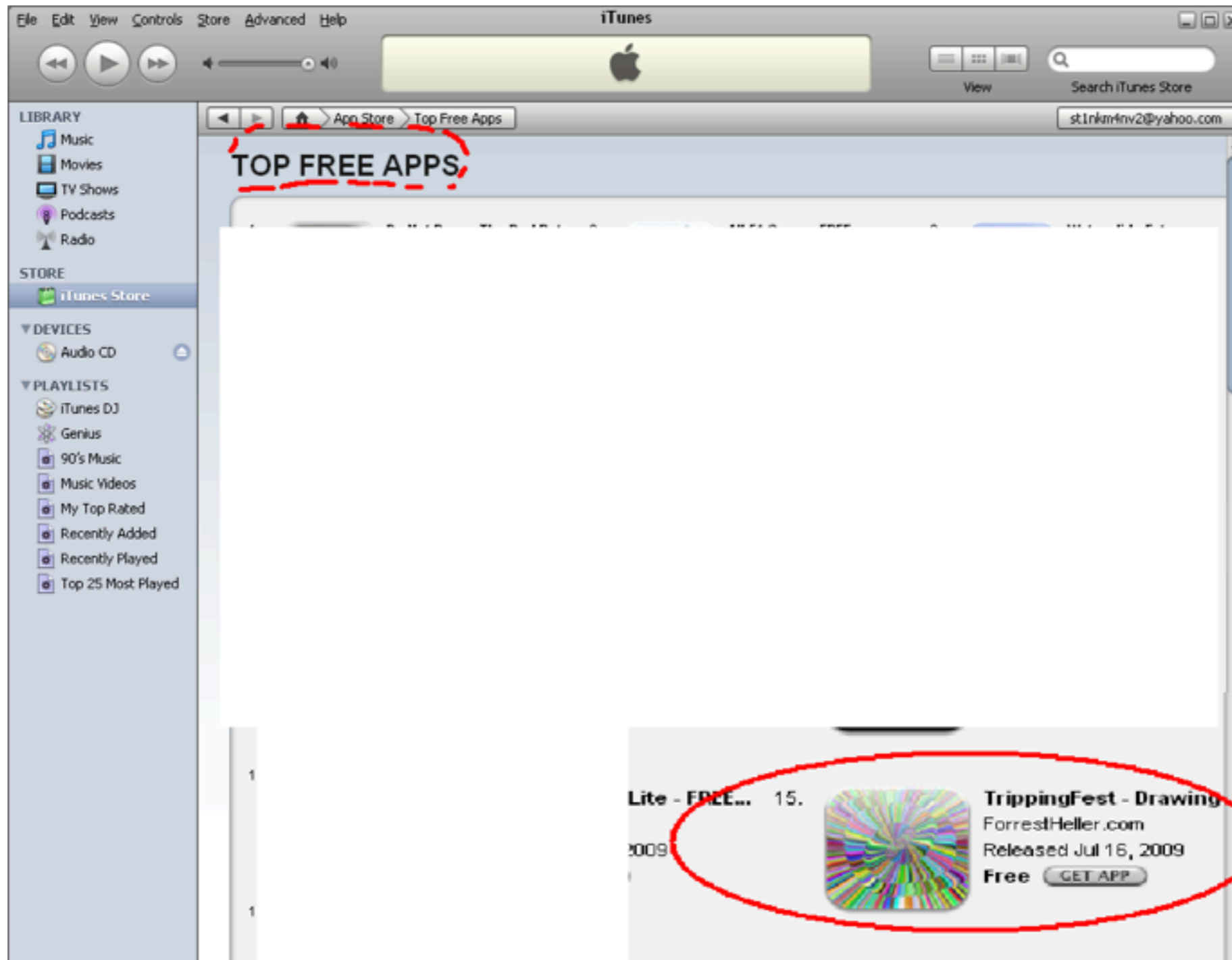
- iTunes DJ
- Genius
- 90's Music
- Music Videos
- My Top Rated
- Recently Added
- Recently Played
- Top 25 Most Played

- | | | | | | | | | |
|-----|---|--|-----|---|---|-----|---|---|
| 37. |  | Which Country Do You Belong To?
Trippert Labs
Released Jul 20, 2009
Free GET APP | 38. |  | Where Should You Get a Tattoo?
Trippert Labs
Released Jul 24, 2009
Free GET APP | 39. |  | i.TV
i.TV
Released Jan 15, 2009
Free GET APP |
| 40. |  | Moviefone
AOL
Released Apr 29, 2009
Free GET APP | 41. |  | Yo Mama: Free
100 Proof Software
Released Jul 20, 2009
Free GET APP | 42. |  | iGirl - She Obeys (Lite)
Resistor Productions, LLC
Released Feb 20, 2009
Free GET APP |
| 43. |  | How Selfish Are You?
Trippert Labs
Released Jul 14, 2009
Free GET APP | 44. |  | Drinking Games FREE
FAR Apps
Released Mar 08, 2009
Free GET APP | 45. |  | How Ditzzy Are You?
Trippert Labs
Released Jul 15, 2009
Free GET APP |
| 46. |  | Weird Laws FREE
Jew Busbilla
Released Jun 25, 2009
Free GET APP | 47. |  | What's Your Destiny?
Trippert Labs
Released Jul 20, 2009
Free GET APP | 48. |  | TMZ
Telepictures Productions
Released Jan 15, 2009
Free GET APP |
| 49. |  | Arcade Claw Lite
JOHN MOFFETT
Released Jun 27, 2009
Free GET APP | 50. |  | TrippingFest - Drawing an...
ForrestHeller.com
Released Jul 16, 2009
Free GET APP | 51. |  | How Stressed Are You?
Trippert Labs
Released Jul 19, 2009
Free GET APP |
| 52. |  | Where Should You Get Pierced?
Trippert Labs
Released Jul 21, 2009
Free GET APP | 53. |  | Ringtone Recorder Unlimi...
FunMobility
Released Jun 22, 2009
Free GET APP | 54. |  | Sexy Girls & Hot Bikini - AppZap
AppZap
Released Jul 15, 2009
Free GET APP |
| 55. |  | Wallpapers Deluxe
Cellfish Media LLC
Released May 05, 2009 | 56. |  | How Special
Trippert Labs
Released Jul 12, 2009 | 57. |  | What's Your Element?
Trippert Labs
Released Jul 20, 2009 |

I'm a Windows Developer

- Right?

Screenshots claim:



Switched it to paid \$1 USD

- Hovered in the Top 100 Entertainment list

In Jan. 2010, released a Lite version

- Lite = Free Trial (usually with Ads)
- (Never thought I would ever create adware!)
- Common practice in mobile applications
- Accepted by both developer and user

Anyway--back to the story

File Edit View Controls Store Advanced Help

iTunes

trippingfest

View Search iTunes Store

LIBRARY

- Music
- Applications

STORE

- iTunes Store

DEVICES

- Audio CD

PLAYLISTS

- Genius
- 90's Music
- Music Videos
- My Top Rated
- Recently Added
- Recently Played
- Top 25 Most Played

App Store Entertainment

ENTERTAINMENT

Page 1 of 974 Sort by: Release Date

TOP PAID APPS

- The Moron Test** Entertainment
- Pocket God** Entertainment
- SpinArt** Entertainment
- iGun Pro - The Origin...** Entertainment
- This American Life** Entertainment
- 18,000 COOL JOKES** Entertainment
- Texts From Last Night** Entertainment
- Talking Carl** Entertainment
- The Impossible Quiz!** Entertainment
- Smosh iShutUp** Entertainment
- TrippingFest 2 - Draw...** Entertainment





















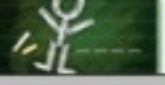
TOP FREE APPS

- TrippingFest 2 - Drawin...** Entertainment
- Glow Doodle Animato...** Entertainment
- Do Not Press The Red...** Entertainment
- Movies** Entertainment
- Burglar Alarm... FREE!** Entertainment
- IQ: how SMART am I?** Entertainment
- iGun Pro LITE - The Or...** Entertainment
- Backgrounds** Entertainment
- Voice Changer Plus** Entertainment
- A Mood Pad - Heat Se...** Entertainment
- The Imbecile Test** Entertainment

Rank	App Name	Category	Price	Release Date
1	1 2 25	Entertainment	Free	Feb 19, 2010
2	2,010's Best Pop Albums	Entertainment	Free	Feb 19, 2010
3	2,010's Best R&B & Soul ...	Entertainment	Free	Feb 19, 2010
4	2,010's Best Rock Albums	Entertainment	Free	Feb 19, 2010
5	AA+ Coin Magic	Entertainment	Free	Feb 19, 2010
6	AA+ Fake Call Pro	Entertainment	Free	Feb 19, 2010
7	AA+ i	Entertainment	Free	Feb 19, 2010
8	AA+ Space Ball	Entertainment	\$0.99	Feb 19, 2010
9	Adult Have You Ever	Entertainment	Free	
10	a Genius will Guess !	Entertainment		

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- Applications
- RE
- iTunes Store
- VICES
- Audio CD
- PLAYLISTS
- Genius
- 90's Music
- Music Videos
- My Top Rated
- Recently Added
- Recently Played
- Top 25 Most Played

TOP FREE APPS

- | | | |
|--|--|---|
| 1.  Catch The Egg
Hudson
Updated Nov 05, 2009
Free GET APP | 2.  TrippingFest 2 - Drawing and Sketching Lite
ForrestHeller.com
Updated Feb 16, 2010
Free GET APP | 3.  Glow Doodle Jump
ITM/V
Updated Feb 17, 2010
Free GET APP |
| 4.  Air Assault
SnakeHead Software, LLC
Updated Feb 16, 2010
Free GET APP | 5.  FaceFighter
Appy Entertainment, Inc.
Updated Dec 22, 2009
Free GET APP | 6.  The Imbecile Test
MS Games
Updated Feb 04, 2010
Free GET APP |
| 7.  Sunday Lawn
Donut Games
Updated Feb 10, 2010
Free GET APP | 8.  FortuneBall
Throwspace
Updated Jan 20, 2009
Free GET APP | 9.  Battery Boost
Appventions
Updated Feb 12, 2010
Free GET APP |
| 10.  5-0 Radio (Live Police, EMS, Fire Rescue Sca...
New & Popular
Released Feb 18, 2010
Free GET APP | 11.  Voice Changer Plus
Arf Software
Updated Feb 02, 2010
Free GET APP | 12.  Tiki Totems
spokko
Updated Feb 11, 2010
Free GET APP |
| 13.  SI Swimsuit 2010
Time Inc.
Released Feb 09, 2010
Free GET APP | 14.  iMobsters™ - 24 Favor Points
Storm8
Released Feb 05, 2010
Free GET APP | 15.  New York 3D Rollercoaster Rush FR
Digital Chocolate, Inc.
Updated Feb 10, 2010
Free GET APP |
| 16.  NBC Olympics on AT&T
AT&T Inc.
Updated Feb 16, 2010
Free GET APP | 17.  Glow Doodle Animator Lite
mssg studio
Updated Feb 16, 2010
Free GET APP | 18.  Labyrinth 2 Lite
Illusion Labs
Updated Feb 12, 2010
Free GET APP |
| 19.  Facebook
Facebook
Updated Jan 14, 2010 | 20.  Dead Strike (Ragdoll Zombies Bullet Time S...
Psychoz Interactive
Updated Feb 04, 2010 | 21.  Hangman Free
Optime Software
Updated Feb 16, 2010 |

TrippingFest

- Over 1 million downloads (Paid and free combined)
- Previously most popular program: Alarm Clock of Justice for Windows (tens of thousands of downloads)
- Maybe Top 6 ranking for Top Paid app?
- It's all a BLUR!

Clarification

- TrippingFest was updated fairly frequently with new releases and bugfixes

The iOS Runtime

- CoreFoundation: Set of C APIs
- NS (NextStep) Foundation: Objective-C equivalent of CoreFoundation.
- Objects usually immutable by default but have mutable variants
- Here are the basics (alongside HTTP communication and XML parsing):
 - Ref counting for all!
 - String handling (NSString, NSMutableString)
 - Collections (Array, Set, Dictionary -- These use ref counting! Cannot hold non-Objective-C objects without using NSValue wrapper!)
 - RunLoop (You can schedule events in the run loop. Examples: Timers, sockets)
 - Threads (wraps POSIX threads)
 - Asynchronous sockets (CFSocket--actually runs in another thread and selects())

iOS likes single threaded with callbacks

- The “delegate pattern”
- `stream.delegate = myStreamDelegate`
- Your `myStreamDelegate` will now get callbacks for events
- Apple APIs seems to abhor blocking in general
- Makes sense: hardware has no support for simultaneous execution of threads
- Name a CF or NSF API IO call that blocks by default--I can't

My Next App

- TrippingFestParty
- Still working on it

A decision I often make

- Use Objective C (A compelling argument and my default choice)
- Use C++ STL
- Use C equivalent

Considerations

- Profitability
 - Financially
 - Code maintainability
 - Simplicity
 - Correctness
 - Portability

What to do: strings

- Clear case for NSString
 - All iOS text is set as an NSString
 - Helps make encoding issues go away
 - Provides string operations you would expect
 - If in doubt, can always convert to C strings

What to do: sockets

- Go with: BSD sockets (non blocking)
- Tried CF.Sockets with NSStream
 - Required significant magic
 - BSD sockets are a known quantity
 - Try cocoaasyncsocket if you want

One place where CFSockets shine!

- Asynchronous equivalent of getaddrinfo
- I thought it might just call getaddrinfo on a separate thread, but it does not (calls something else)

What to do: threads

- Doesn't matter for the most part
- Objective-C sync primitives are equivalent to POSIX sync primitives (mutex, semaphore)
- Objective-C doesn't have joinable threads, though
- Objective-C can execute messages on objects in arbitrary threads or with an arbitrary delay (I think it's cool!)

What to do: Collections

- **Objective-C -- very nice if you're working exclusively in Objective-C.**
- `NSNumber* n = [[NSNumber alloc] initWithInt:5];
[numberArray addObject:n];
[n release];`
- Dictionary type requires NSString for keys
- I use simclist for performance-critical lists (Copyright (c) 2007,2008 Mij <mij@bitchx.it>)
- NSDictionary not available on iOS -- I use C hashtable (Copyright (C) 2002 Christopher Clark <firstname.lastname@cl.cam.ac.uk>)

It's not that much overhead to send a message or two!

- Right, but I have to send many messages per frame (10,000+ - 100,000+)
- Also note that malloc implementation is quite fast for small objects (negligible concern)
- Story time

Using Instruments profiler

- Saw 10% of running time taken by forwarding Objective C messages
- Don't remember seeing this before!

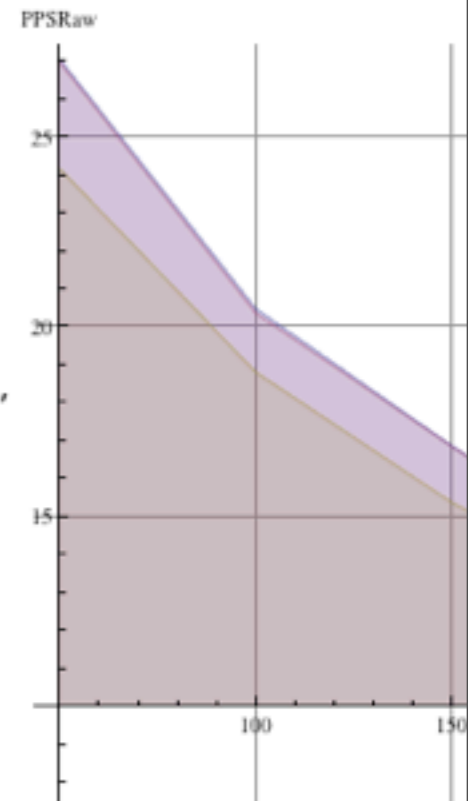
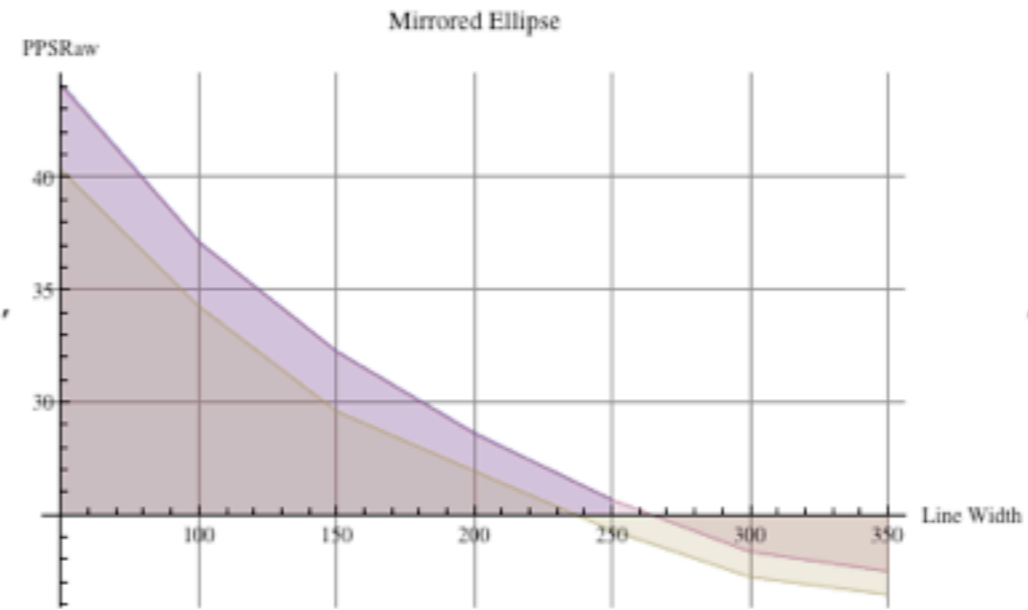
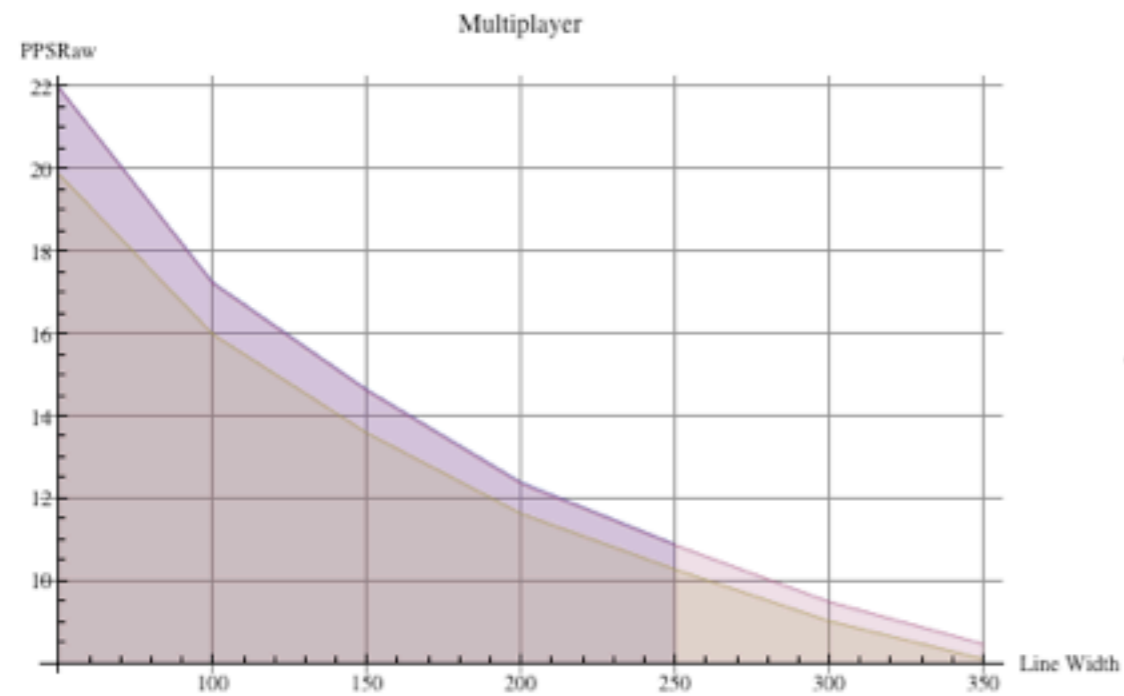
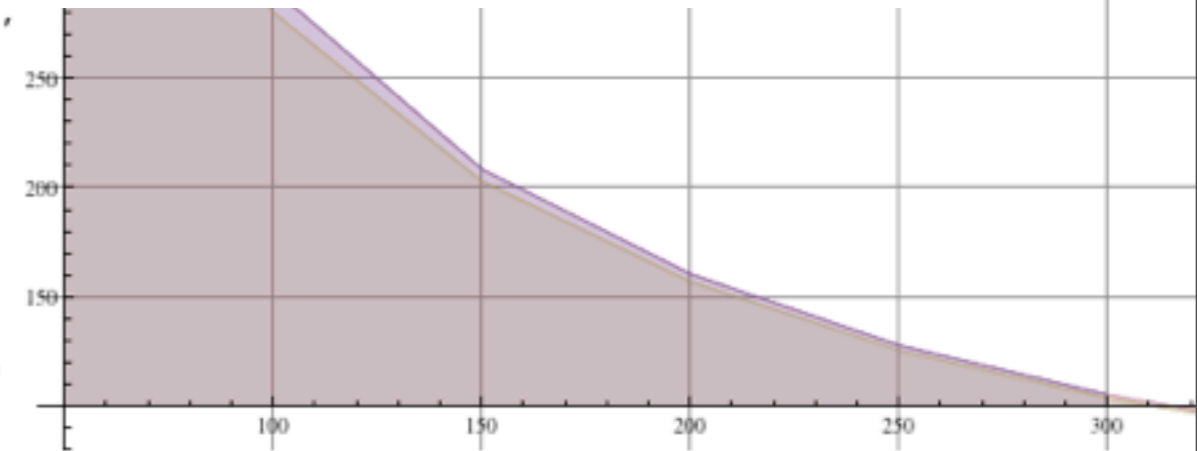
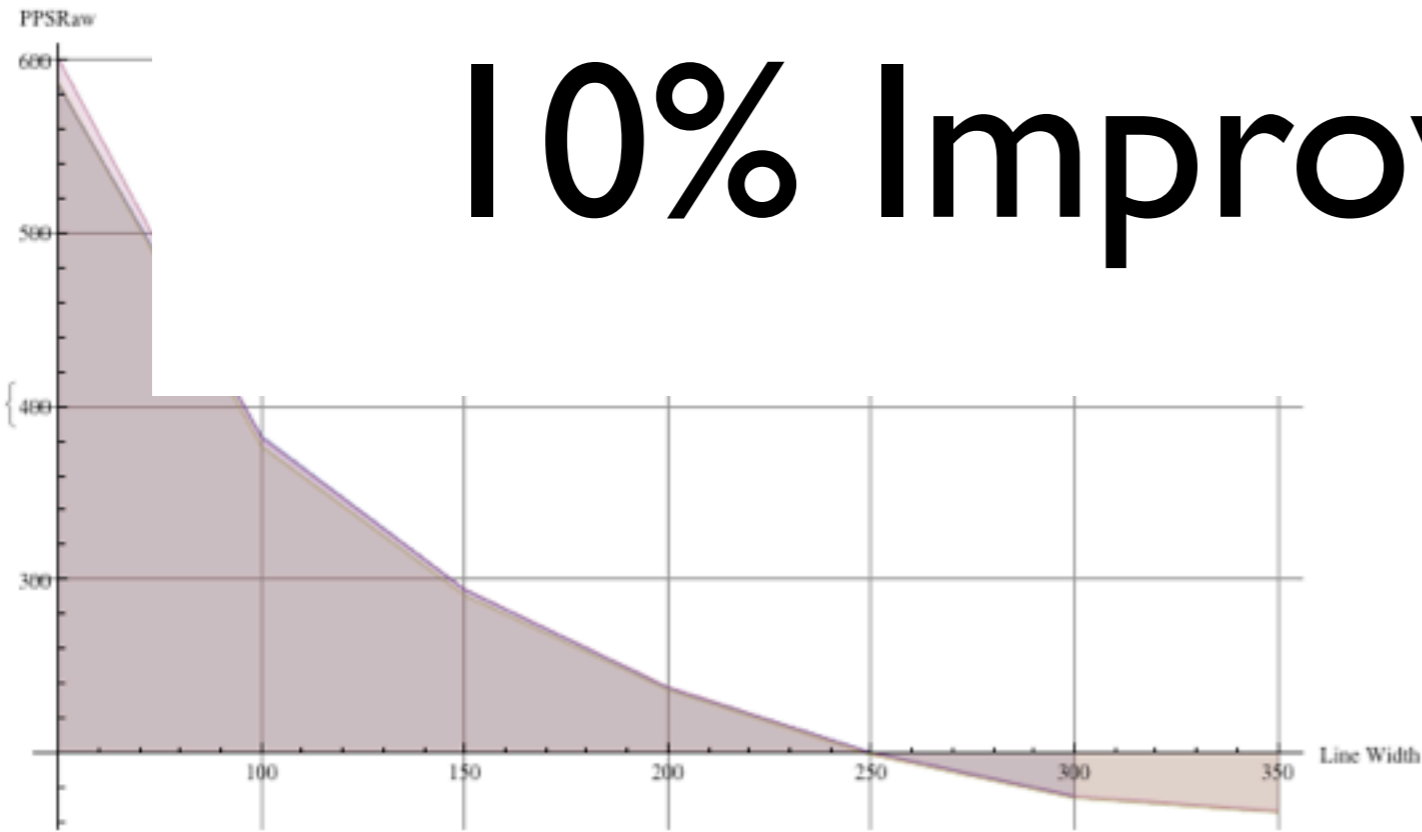
Stupid Instruments

- Opened Shark

Saw the same thing

- Converted a few heavily-called classes to C++
- Didn't optimize anything

10% Improvement



Advertising

- This can be a big source of revenue for apps (sometimes this eclipses the paid app version revenue)
- Big names that come to mind (may be outdated):
 - AdMob
 - Mobclix
 - Quattro (now iAds)

I use Mobclix

- Advertising exchange--negotiate between networks and developers
- Will manage advertising network accounts for developers (awesome for hobbyists!)
- They have a magical eCPM (make me more money) optimizer that switches between ad networks in real time
- Claims to have better eCPM than AdMob

Mobclix

- But you have to hassle them for payment
- They say they don't take a cut of revenue

iAds

- From Apple
- Quattro-turned-Apple contact tells me eCPM is very high (gave me a number that was better than Mobclix)
- Apple will pay on time

AdMob

- Acquired by Google
- Not much known to me

App Marketing Tactics

- Peer pressure -- limited effectiveness in the long run
- Set up a Facebook page (Ryan Gibbons did this for me and later I incorporated it into the app)
- “Make a webpage” -- one of the Internet marketers here

App Marketing Tactics

- So really I have no idea
- Lots of Internet Marketing Professionals in FCIP--guys?

App Marketing Tactics

- I get emails asking me to pay for reviews or downloads
- Does it work?
- I don't know--never did it
- Honestly, it's just lame!

And now a collection of Random Tips

- Maybe help someone save some time

Quick Measuring Tool Rundown

- Instruments: let me just show you all the things it measures (Based on DTrace)
- Shark: being deprecated in iOS 4
- I loved it
- Lower overhead than Instruments
- Showed a lot of good info at the assembly code level



Game Center

- Tip: To simulate over-the-Internet play, go to your home wireless router settings and turn on AP Isolation
- This isolates your iOS devices from communicating directly over the wireless network and forces them to go through Apple's Secret Bunker (with STUN2!! YAY!!)

C++ Destructor not called?

- If your C++ object is an instance variable of an Objective C object, you **NEED TO TURN OFF NSZombieEnable** on your executable
- <http://www.cocoabuilder.com/archive/cocoa/226062-instance-variables-not-destructed-if-nszombieenabled.html>

- Took me a whole day

Objective-C++

- Pulled out otool, lots of disassembly, very upsetting
- Turned out the only difference in builds was a configuration setting in the project settings files
- After I found it I Googled to see if the problem was documented and I missed it
- Hopefully this slide has more relevant keywords

Stepping through Apple Code the “Painless” way

- Go to Tools->Debugger->Show Assembly Code Only
- You may now step around Apple’s code
- There are only a few ways out of objc_SendMsg routine
- ARM calling convention: arguments in registers r0-r3, rest of args on stack
 - GCC: print (char*) \$r1 for ObjC msgs
 - po \$r0 -- prints Objective-C object
 - Sometimes r7 acts as frame pointer

Picture Save Quality

UIImageWriteToSavedPhotosAlbum

- When you save a picture to the photo album, **ALWAYS SAVE THE PHOTO AT THE NATIVE SCREEN RESOLUTION**
- Otherwise Apple will distort your photo
- Early versions of TrippingFest had ~360x450 photos being saved as 2000x2000 something pixels
- Apple saves photos at 75% JPGs always (Seen the disassembly)

Memory

- iOS virtual memory system does not swap pages to disk when out of memory
- iOS sends out a warning or two to each application
- If still out of memory, iOS starts killing apps with high memory usage
- Very rare for TrippingFest

Cool Strategy

- John Carmack reminds us that flash memory has much lower access time than a magnetic hard disk
- You can memory map (mmap) resources and turn off caching!

Memory Mapping

Tests for 4MiB	Flash average (ms)	DRAM +Cache average (ms)
memset	13.55	7.41
read	85.32 (std dev:10)	84.25
unoptimized write	239.00 (std dev:10)	226.532

Memory Mapping

- TrippingFestParty uses memory mapping to hold 768x1024 bitmaps for undo/redo buffers with no noticeable performance slowdown

Users: A Different kind of Profiling

- Who are these iPhone users?
- Why do they love iPhone so much?

Case Study: Roommate

- Fake name: Phil
- Owns iPhone 4
- Has owned previous iPhones
- Stood in line for iPhone 4 with other people

Back when I checked iTunes rankings

- Screensaver apps were very popular

I Thought

- “Wow, iPhone users really like screensavers!”

But then my roommate came up to me

- And offered an app suggestion
- Happens all the time to developers
- Usually the ideas are not good or the app already exists and people did not elect to use the “search” bar

My Roommate Suggested

- You should make an app that has a woodpecker standing over a bowl of water.
- The woodpecker bends over and puts his head in the bowl of water
- The color of the water changes and slowly ripples out and mixes with any prior colors

And I was all

- Ok, hold on, this is a screensaver app
- Why do iPhone users have a fetish for screensavers?

And he was all like

- Pivotal moment in development career
- He said: **“When Koi Pond came out, it was one of the early apps. You bought the app so that when you showed people your iPhone and they asked what it can do, you could show them the Koi Pond.”**
- **Emphasis and excitement mine**

Apple

- Computers are fashion

How I will use this information

- I won't
- No changes to the plan
- The plan is still to enable users to draw ***crazy*** pictures

Also

- Roommate noticed that Solitaire was draining his battery
- I asked if that stopped him from playing Solitaire and he said “not really”
- Users know if you drain their battery
- TrippingFest is performance intensive-- actually a goal to use the hardware to drain the most power

What do users say about TrippingFest?

- Let's start with some one star reviews (the worst rating possible)

IMG_0276.PNG ★★★★★

by Bfaile - Version 2.4 - Feb 28, 2010

That was the best game ever I loved the whole game

0 out of 1 customers found this review helpful

Awesome ★★★★★

by Cara22 :) - Version 2.4 - Jul 5, 2010

Best app so fun cool so much more to do than the lite version worth the dollar!!!!

Best app ever ★★★★★

by Chassen1236 - Version 1.2 - Jul 18, 2009

First You Have To Put Yh

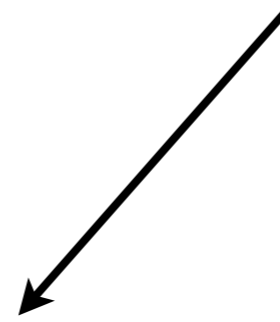
0 out of 4 customers found this review helpful

App ★★★★★

by Pump cat - Version 1.2 - Aug 2, 2009

Dear lord this app is the best

Holy crap guys



Best app ever ★★★★★

by Chassen1236 - Version 1.2 - Jul 18, 2009

First You Have To Put Yh

0 out of 4 customers found this review helpful

App ★★★★★

by Pump cat - Version 1.2 - Aug 2, 2009

Dear lord this app is the best

Predjudice ★★★★★

by - Version 1.2 - Aug 7, 2009

This app is prejudice againts Jews. The 4 counter clockwise swirls looks like a nazi sign.

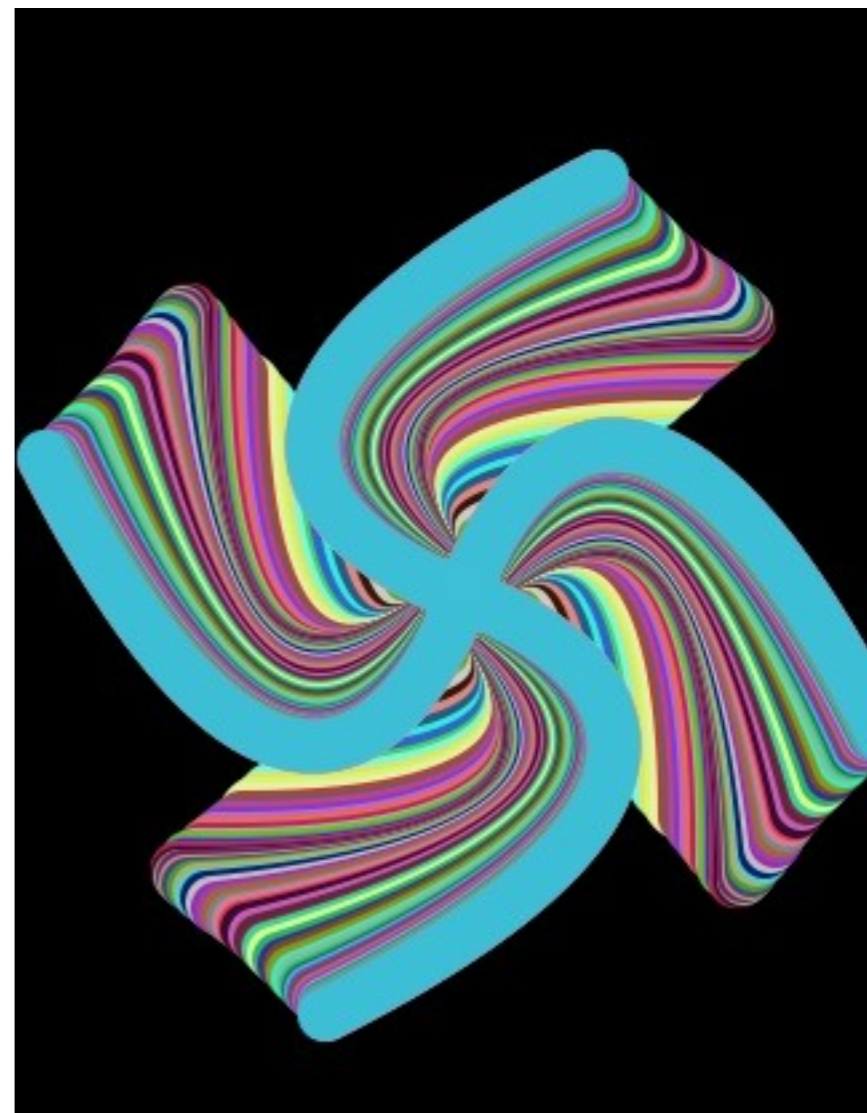
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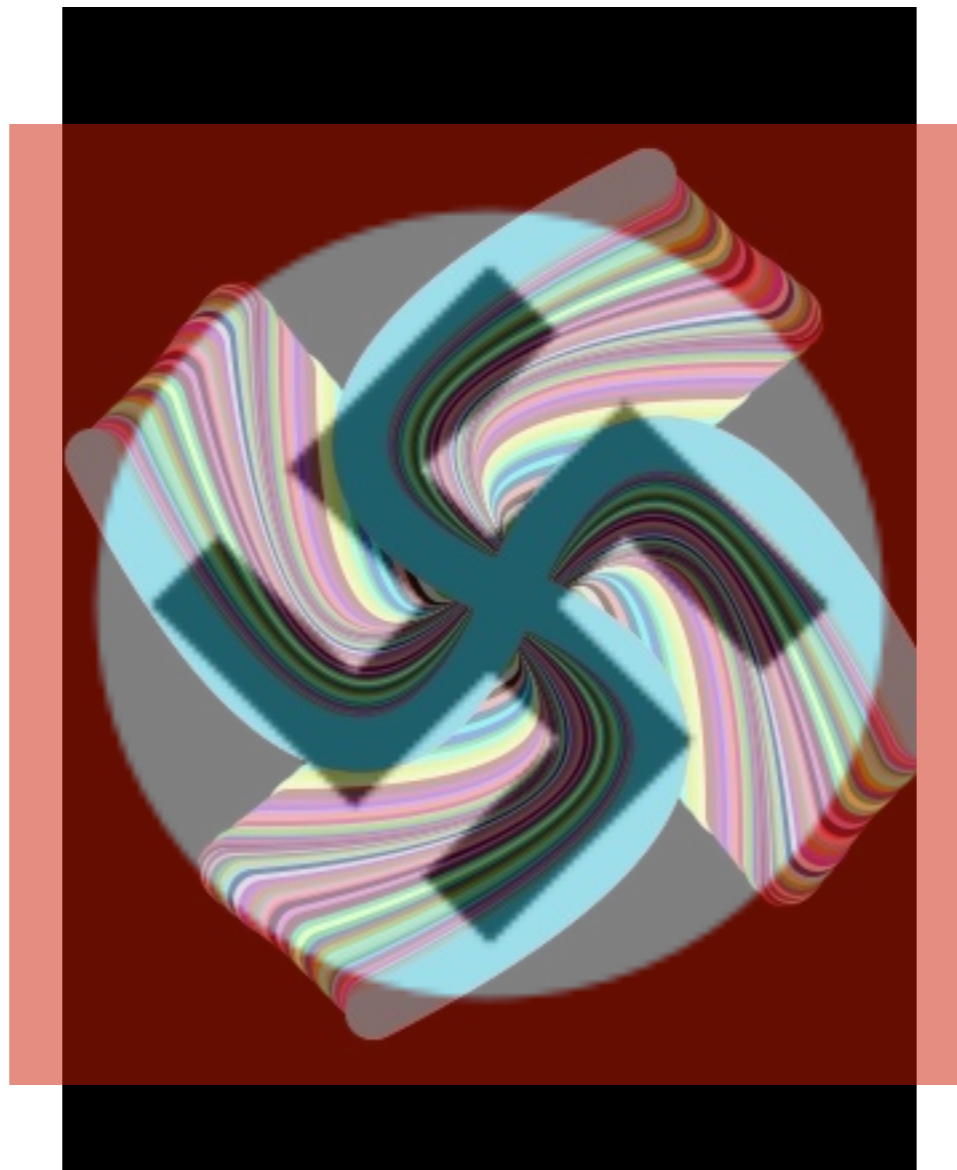


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0 out of 1 customers found this review helpful



There are serious complaints

O_o ★★★★★

by noone19 - Version 2.0 - Dec 11, 2009

It crashes on opening :0

It's good, but there's one thing... ★★★★★

by jmixer105 - Version 1.2 - Aug 8, 2009

[Report a Concern >](#)

I <3 this app! But there is one problem, it's ruining my eyes. My suggestion for a future update is to allow the application to run in landscape, not just portrait mode.

Jerky on iPhone 4 ★★★★★

by Koaliemolly - Version 2.4 - Aug 4, 2010

[Report a Concern >](#)

Used to be my favorite app but unusable on iPhone 4 because lines are jerky, erratic and it's impossible to create a smooth curve. Please, please say this will be fixed!

Good app ★★★★★

by kenneth bolton - Version 2.4 - Mar 1, 2010

[Report a Conc](#)

I love this app. It's worth adollar but how do you draw the example pictures needs instructions. Please update apple. It's needs instructions telling you what everything is and does.

Awesome ★★★★★

by Midnite333 - Version 2.4 - Jun 1, 2010

[Report](#)

Great but we should be able to save what we put in the settings or the place where you can put mirrors and stuff. But great app□□□

... ..

Do users notice things?

Well it got better ★★★★★

by Civsun5000 - Version 2.3 - Jan 25, 2010

At first it was a junk but now better and improved!!!!!! □□□□□□□□

Users respond to each other in reviews

Great...but.... ★★★★★

by Susan Beezley - Version 2.4 - Feb 21, 2010

[Report a Concern >](#)

Cool app... I'd give it 5 stars if they would fix one problem. When you hit the button to go to the full screen mode so you can draw on the whole upper portion under the menu bar, there is no where to click back to get the menu bar back so you can save your work. And if you get out of the program, and then reopen, your art has dissapeared. Very frustrating....please fix!....

15 out of 16 customers found this review helpful

Was this review helpful? [Yes](#) | [No](#)

The menu bar problem answered ★★★★★

by Ya it's me - Version 2.4 - Feb 21, 2010

[Report a Concern >](#)

There is a way to get the menu bar to come back after you press the button to hide it. All you have to do in shake your iPod or iPhone and it will apper. I will say though that this part frustrates me. I'm drawing and have hidden the menu bar and will try and get it back by shaking my iPod lightly, but it doesn't come back until I have shaken it about four more times, harder and harder, and when it eventually does come back I'm ended up frustrated. This might be though because I draw when something bothers me. All that aside this is still THE best drawing app I have found, you probably can't make the sample pictures, but I'm still amazed at the things I can make. Five stars.

Was this review helpful? [Yes](#) | [No](#)

Users sometimes don't trust developers

Lots of “You can't draw sample pictures”
(see previous slide)

Actually, some of the sample pictures are drawn by users.
I eventually included instructions.

Sometimes users gloat

Hahahahaha ★★★★★

by Gemmy bob - Version 1.4 - Aug 29, 2009

Ha ha I got it for free when I got it, it just came out!

No offense but.. ★★★★★

by Yo mamma217 - Version 1.2 - Aug 24, 2009

In ur faces!!! I got when it was free□□□□□□□□

But my favorite review

Never Gits old ★★★★★

by Salsaman45 - Version 1.4 - Sep 7, 2009

Wooooooooooooooooooooooooooooot! OMAZING I LUV THIS APP MORE THAN MY WHOLE FAMILY!!!!!!

Was this review

But my favorite review

Never Gits old ★★★★★

by Salsaman45 - Version 1.4 - Sep 7, 2009

Wooooooooooooooooooooooooooooot! OMAZING I LUV THIS APP MORE THAN MY WHOLE FAMILY!!!!!!

Was this review

TrippingFest

But my favorite review

Never Gits old ★★★★★

by Salsaman45 - Version 1.4 - Sep 7, 2009

Woooooooooooooooooooooooooooooot! OMAZING I LUV THIS APP MORE THAN MY WHOLE FAMILY!!!!!!

Was this review

~~TrippingFest~~

HomeWrecker

Internationalization

- Besides English, TrippingFest also knows
 - French
 - Spanish
 - Japanese

Internationalization

- I don't speak those languages

Internationalization

- I don't speak those languages
- But Google does!

LOL

Internationalization

- Automated translation of TrippingFest using Google Translate
- Spot checked some results with Yahoo Babelfish
- Sometimes non-English phrases were too large for UI elements or phrases didn't translate: had to find another phrase

Japanese

- Google left very few English words untranslated
- To me, this implied a high confidence and a low error rate

Internationalization

- One day, sat down with a friend who is a native Japanese speaker. (Thanks Yuki!)

Internationalization

- One day, sat down with a friend who is a native Japanese speaker. (Thanks Yuki!)
- The best error: “Swirl” => “Swastika”

Internationalization

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WHAT
!!?!??!?!?
\$*@(\$*()



Other notables

- “Polar” => “The jungle? The wild?”
- “Green: x%” => “It’s asking me like ‘Green-- how much? ..how much does it cost?’ ”

Someone helped me translate the French

- Said the translation was “cheesy”
- Will update after TrippingFestParty (Don't want to lose focus on Party)

Spanish

- No one has complained yet

Sales boost?

- Not really

As you may have noticed

- A lot of people helped me build TrippingFest
- They are listed in the credits, which are quite long
- Majority not even mentioned in this presentation (take too long!)

Also

- Buy Birdsquadron the iPhone app

Off The Record

- We need to talk

TrippingFestParty

- Next generation of TrippingFest
- Now that I know the platform, writing iOS apps is much easier

TrippingFestParty

- Draw with other people
- Runs on an iPad (BIG TOUCH SCREEN-- the original reason for TrippingFest on iPhone)

TrippingFestParty

- First take: Use Quartz 2D library like TrippingFest
- FAIL
- Native screen resolution (768x1024) is too many pixels for CPU
- Used Shark for profiling (SHARK IS REALLY COOL!)
- Most time spent in updating screen

TrippingFestParty

- Second take: Ignore Apple documentation about `CGLayer` being faster and do some tweaking
- Hunch is correct!

TrippingFestParty

- Don't use CGLayers for Quartz drawing
- Allocate a bitmap with malloc
- Wrap that in a CGContext
- Draw on the CGContext
- For screen refresh, wrap bitmap in a new CGImage (yes, every frame!) and set `view.layer = that CGImage`

TrippingFestParty

- Still too slow (20 FPS is not very crazy)

TrippingFestParty

- Took the plunge to learn OpenGL and graphics programming
- Oh my what an adventure

Compilers

- GCC 4.2
- GCC 4.2 Frontend with LLVM 1.4 backend
- Straight LLVM

For TrippingFestParty, GCC-LLVM was faster than GCC on benchmarks. LLVM and GCC-LLVM is special for doing link-time optimizations (which GCC 4.5 has currently, but I don't have GCC 4.5 for iPhone)

Instruction Sets

- Older devices: ARM 32-bit and Thumb 16-bit
- Point of Thumb is code density
- Thumb doesn't support direct FP operations
- Speedups reported by switching to ARM 32-bit for heavy FP apps

Instruction Sets

- ARMv7 has Thumb2
 - Thumb2 contains the NEON instructions
 - Best of both worlds!
 - Yay!
 - Produced a couple percent speedup on my benchmarks

SIMD

- Arm has a spec for SIMD it calls “Advanced SIMD”
- The implementation of this spec is called NEON
- Can do 32-bit & 64-bit FP as well as 8, 16, 32, and 64 bit unsigned/signed Integer arithmetic
- GCC AND LLVM both generate code to take advantage of ARM’s SIMD FOR FP ONLY!
- You can probably do better by hand-tuning it (I didn’t bother)

SIMD

- If you want to manually use the SIMD
- GCC: <http://gcc.gnu.org/onlinedocs/gcc/ARM-NEON-Intrinsics.html>
- LLVM: <http://blog.lvm.org/2010/04/arm-advanced-simd-neon-intrinsics-and.html>
- Assembly

SIMD

- NEON sits at the end of the ARM pipeline
- Instructions generally execute in one cycle
- 5 cycle latency
- If you move a NEON register to an ARM register that's 20 cycle mandatory stall
- LLVM and GCC do this for some reason