GETTING AHEAD OF THE CURVE

ADAM BELL | NSSPAIN 2015

BIT OF HISTORY

Chat Heads
hack for iOS

Ignition (CarPlay on iPad hack)

BIT OF HISTORY

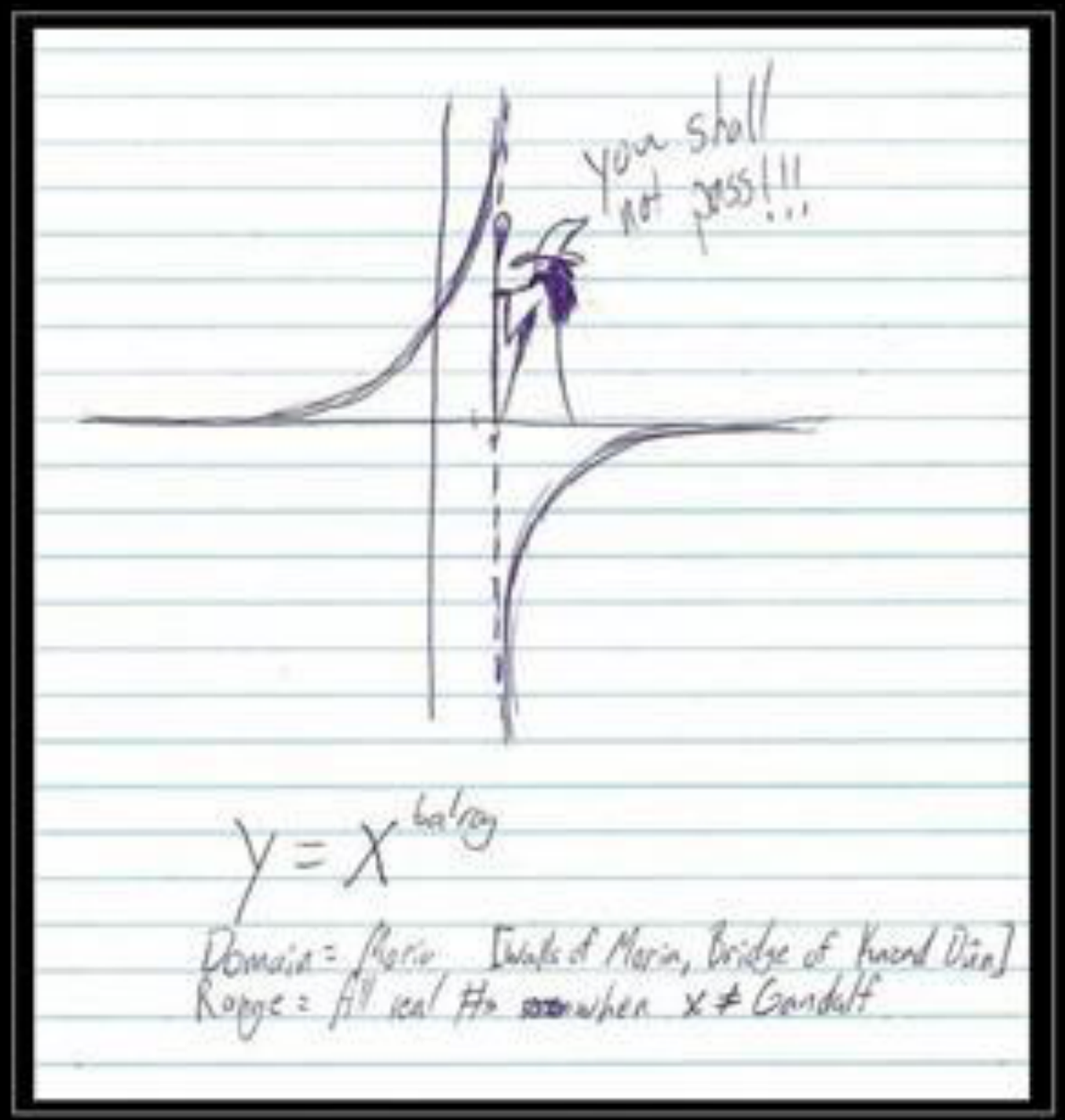
Native UIKit Apps on WATCH

LET'S TALK CURVES...

LOTS OF TYPES OF CURVES

MATHEMATICAL CURVES

$y = -1/x$



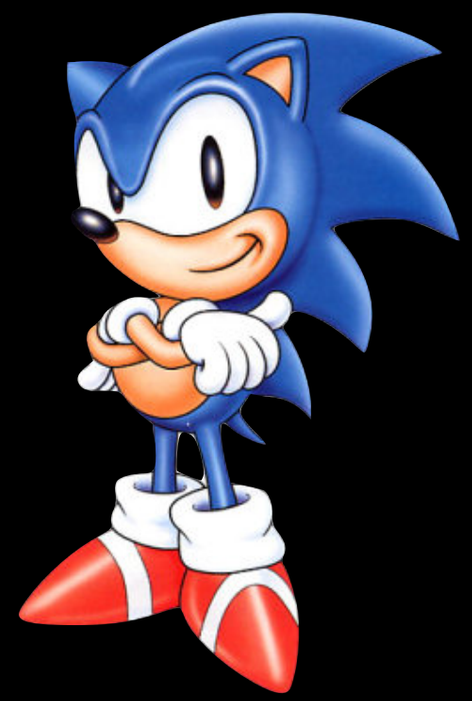
LITERAL CURVE TYPE

- [UIBezierPath
  bezierPathWithArcCenter:CGPointMake(0,0)
  radius:9001
  startAngle:M_PI
  endAngle:(M_PI / 2.0)
  clockwise:**SURE**];
- BOOL a == (YES ? NO ? SURE);
- type... geddit?

THINK OUTSIDE THE... CURVE

- "Siri, what's getting ahead of the curve?"
  - "I dunno, but I found these web results for you:"
    - ಠ_ಠ
- **ahead of the curve**: ahead of current thinking or trends.

EXAMPLES



- loops, à la Sonic the Hedgehog
  - gotta go fast
- Apple is ahead of the curve. Samsung is not.
- AutoLayout™ is... nope, not even gonna go there.
- :)

PICTURE EXAMPLE

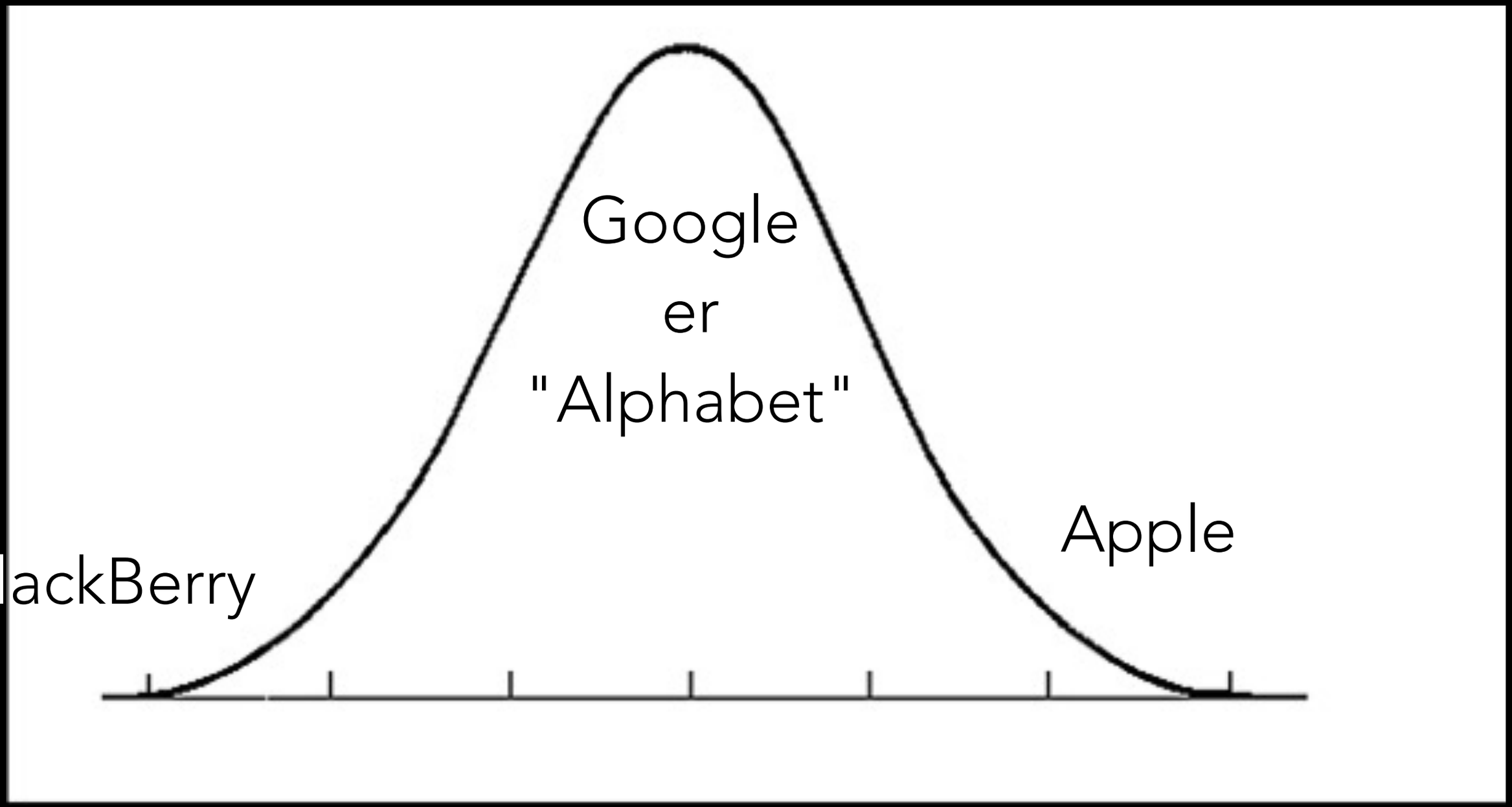


photo cred: @NeoNacho

ADVANCED PROTOTYPES

- since the dawn of time, Apple's been pushing the boundaries of design and what's expected.
- they do this with crazy cool prototypes!
- why can't we do that too?

WWDC

Keynote icon in keynote is super meta

- at WWDC Apple had an "advanced prototyping" session
- aka how to use Magic Move in Keynote :P
- coined the term "Fake it, till you make it"
- why not just make it?

super meta

LOTS OF WAYS TO PROTOTYPE!

Form

Quartz Composer

Origami

Apparently every prototyping tool ever needs a blue icon?

¯_(ツ)_/¯

ON WORKING WITH DESIGNERS...

- never say no to a prototype or design
- "that's not physically possible."
- no u
- hard != impossible
- if it's actually impossible, make it less impossible

HOWEVER...

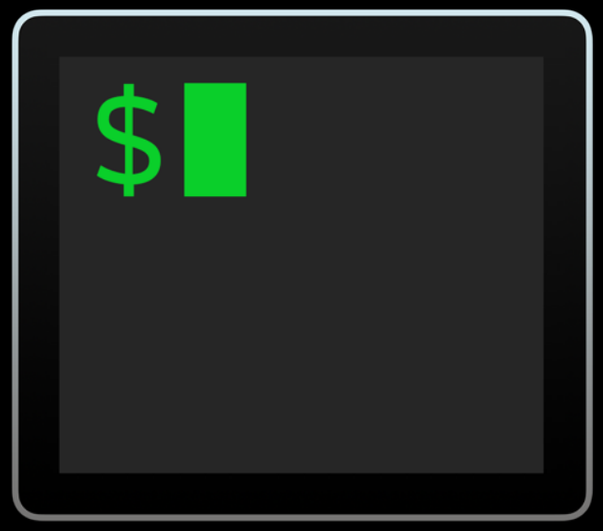
if it's android...

it's already impossible.

:)

PERSONALLY I PREFER...
XCODE + HAX

SOME TRICKS OF THE TRADE

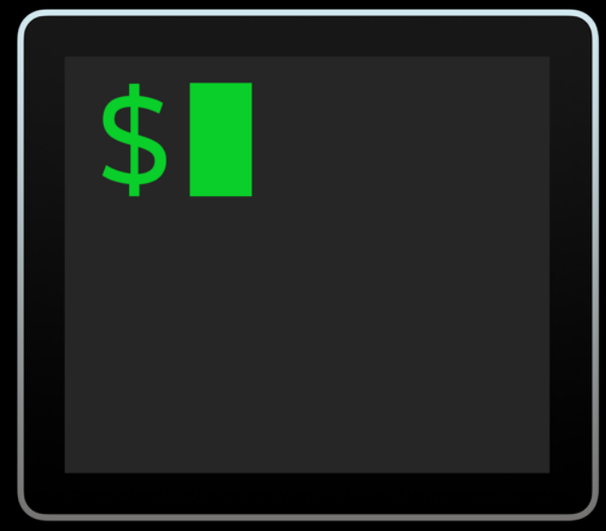


class-dump

atom/sublime/w.e

hopper

CLASS-DUMP



- well… it dumps classes.
  - as headers
- excellent for surveying the (private) API landscape
- works awesome with Atom / Sublime
  - searching headers with quick open!

HOPPER DISASSEMBLER

- my personal favourite
- disassembles binaries
- spits out assembly or half-baked C code.
    - yay assembly! :D

REAL LIFE SITUATION

APPLE KEYNOTE DEV CYCLE

0. New device / feature

1. OMG

2. Adapt new API

4. YOLO, SHIP IT

TIM COOK HOLDING THINGS

All the money from an earnings call

TIM COOK HOLDING THINGS

Rose Gold iPhone 6S+

TIM COOK HOLDING THINGS

Tim Cook

BASICALLY...
TIM COOK HOLDING THINGS...

SHOULD BE A MEME.

#TIMCOOKHOLDINGTHINGS

#NSSPAIN15

APPLE KEYNOTE DEV CYCLE

0. New device / feature

1. OMG

2. Adapt new API

4. YOLO, SHIP IT

WAIT, WHAT ABOUT 3.?

APPLE KEYNOTE DEV CYCLE

- we ship apps for new devices... without testing
  - just to be ready for day 1
    - remember watchOS 1?
- this is insanity
- we can do better

MAKE FEATURES BEFORE THEY EXIST

AKA

MAKE SOMETHING COOL...

BEFORE SOMEONE ELSE DOES

MAKE FEATURES BEFORE THEY EXIST

- anticipate newer features
    - prototype possible things
- play with upcoming ones
    - if you don't haz, mimic them
    - if you can't mimic, fake them
- tldr: get a feel for how they work

HOW?

- Private API
- Private API
  - Private API
    - seriously. 3D touch was leaked like 2 betas early.
    - 2 weeks to dev ➡️ 2 months

3D TOUCH LEAK

PRIVATE API

- stuff Apple doesn’t want you to see / use
  - don't use it publicly.
    - unless you're a ninja.

- usually prefixed with **__underscores__**
  - -___DO_NOT_USE_OR_YOU_WILL_BE_FIRED:
    - ^ cool method name

PRIVATE API

- unreleased features! :D
  - excellent for prototyping new / experimental things
    - basically the entire jailbreak community prides itself on messing with internal Apple things :)
- free things are free!

PRIVATE API

- don't ship it. ever.
- apple can change it at anytime
    - which could lead to app instability
    - which makes your users :(
- k?
- k sweet.

THIS ONE COOL TRICK...

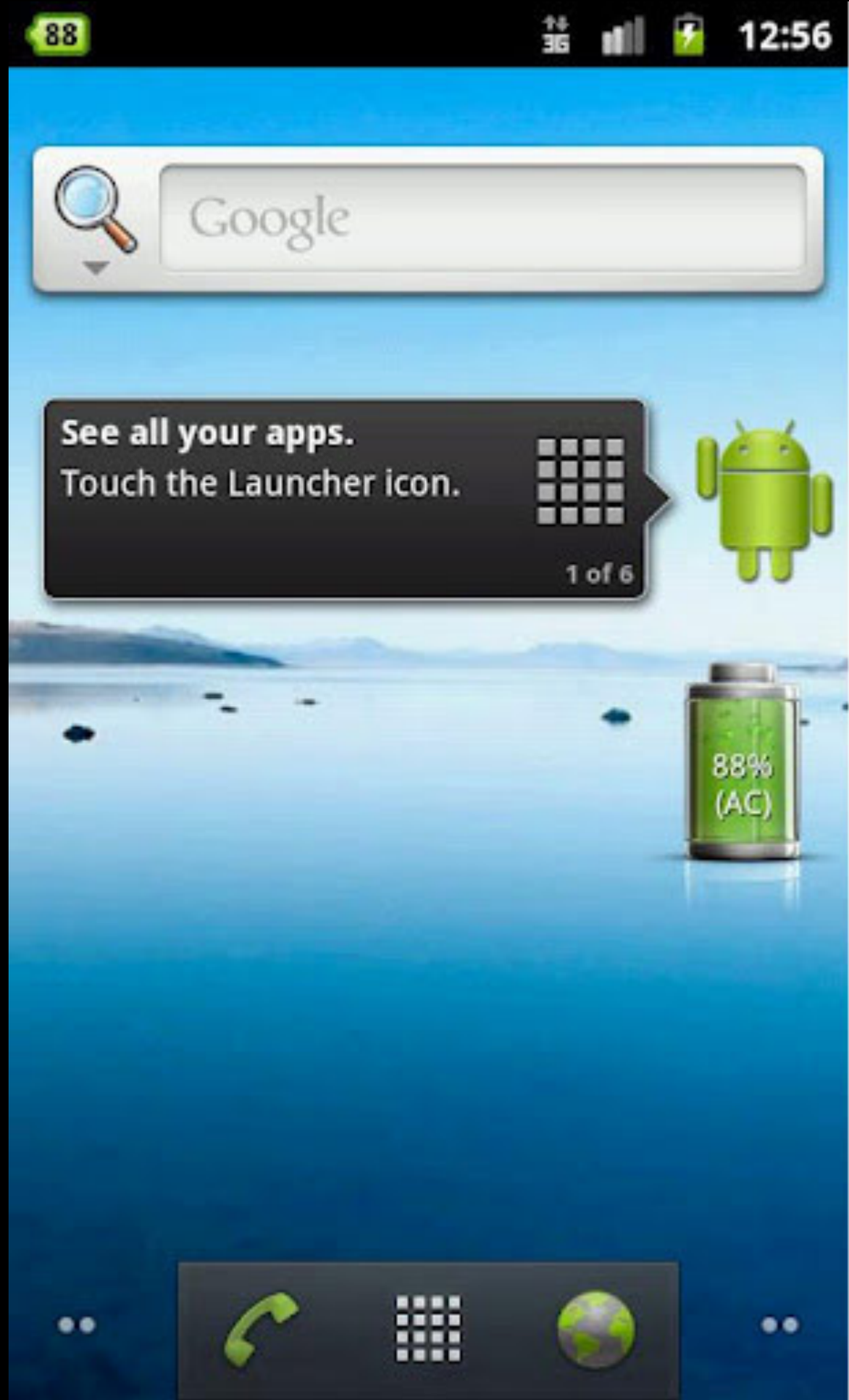
- how 2 b a cool prototyping person
  - use what you have to fake something you don't
  - ... doesn't matter if it's good
  - just do it

FUNNY PRIVATE API

- internalUpdateConstraintsIfNeededAccumulatingViews NeedingSecondPassAndViewsNeedingBaselineUpdate
  - that's a mouthful^
- __Multithreading_Violation_AllThatIsLeftToUsIsHonor__
- - [AVPlayerLayer playerLayerWithPlayer:]

WIDGETS


sup?


88
12:56
Google
See all your apps.
Touch the Launcher icon.
1 of 6
88%
(AC)

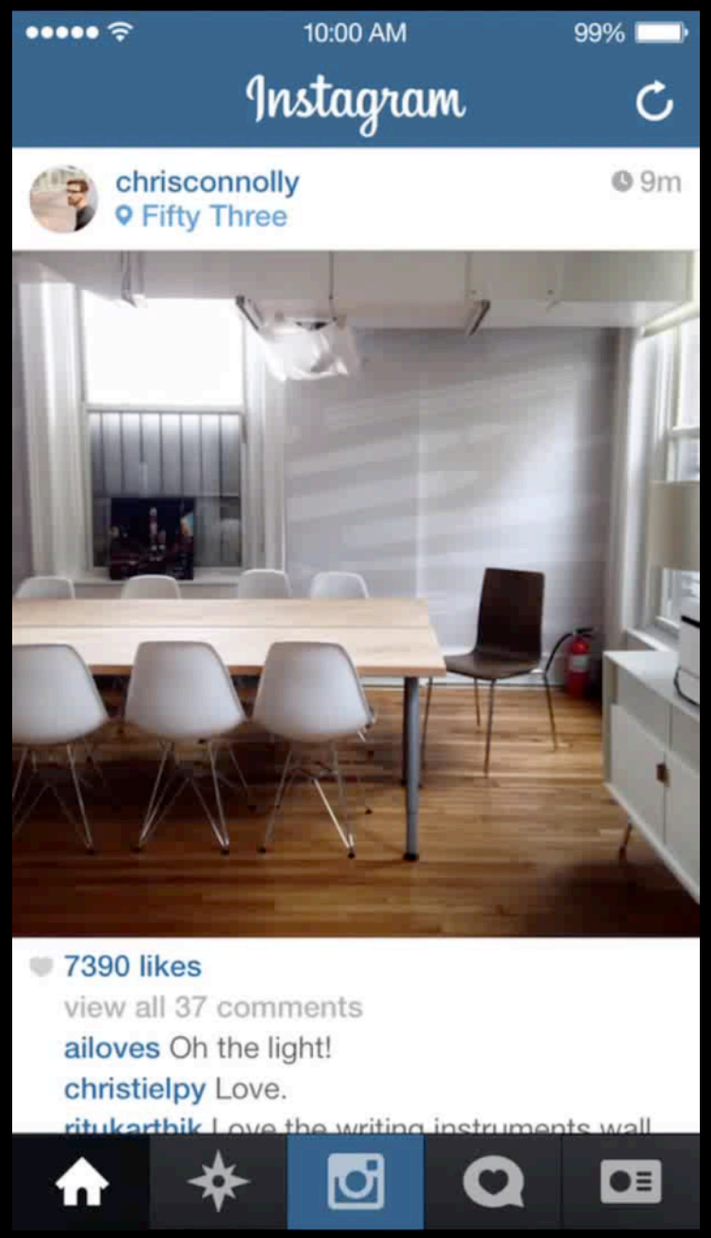
WIDGETS

- convenient access to simple information
- android already has 'em (yay?)
- we'd all love them on SpringBoard
- not notification center
- Apple hasn't given us access yet, maybe someday!
- jk let's make them anyways...

DOOM'D PICTURE IN PICTURE

Why not play games everywhere?

APP SWITCHER



Instagram App Switcher "widget" Prototype

APP SWITCHER WIDGET

- Accomplished with UIApplication...
  - spam app screenshot refreshes with Private API
  - -[UIApplication **_saveSnapshotWithName**:]
  - secret parameter:
    @"**UIApplicationAutomaticSnapshotDefault**"

SPRINGBOARD WIDGETS

- can't really draw dynamic icons :(
- can update notifications / application badge
- let's abuse that!
  - a lot!

INTRODUCING

FANCY LEVEL

FANCY LEVEL

- I've always wanted a leveling app
  - extremely useful when placing paintings
    - but I don't want to open the app (all the time)
- there's totally not a million of them in the App Store
  - let's make one anyways

PROBLEM

- CoreMotion doesn't work in the background :/
- how can we fix this?
  - any takers?

UIKIT + CLASSDUMP

- UIApplication has lots of fun stuff
  - - [UIApplication **setApplicationBadgeString**:]
- super secret
- we can use this to make the icon dynamic

WATCHDOGD

- when you close an application on iOS, it goes to the background
  - thanks to watchdogd
- how do we keep an app open forever?
  - hax.

SILENCE

(THE) SILENCE

- we can play an empty wav file forever
    - iOS "thinks" we're playing music
        - really we're just wasting the battery :P
- this is actually a really common hack

BACKGROUNDING HAX

- register for audio playback background mode
- play music
- music keeps the app running in the background
- whenever we get device motion data, update the badge
- tada!

:D

DEMO

TOUCH IT

3D TOUCH

IPHONE 6S+ HD WITH 3D TOUCH

- a week ago Apple announced 3D touch
  - we don't have any iPhone 6S's (6Ses?) (success?)
- it seems pretty cool
- let's fake it... and make it! :D

(The best Google image result for UITouch... ever)

UITOUCH

- @property (readonly) float **pressure**
- UITouch has had this for years...
  - it doesn't work anymore :(
- -[UITouch **majorRadius**] is now a thing! (as of iOS 8)
  - -[UITouch **majorRadius**] returns the radius of the touch

UITOUCH (GARAGEBAND)

- fun fact:
  - Garageband had pressure sensitivity on its instruments (velocity)
    - was accomplished using the device microphone to listen for louder or softer taps
    - also used the accelerometer (like 3D touch!)

3D TOUCH GESTURE RECOGNIZER

- when a finger is pushed on the screen, it flattens
  - flatter finger ⟶ larger surface area
    - larger surface area ⟶ larger touch radius
- 1.0 is a normal press
- >1.0 is a press with more force (scale unbound)

3D TOUCH GESTURE RECOGNIZER

- example (my hand)
  - a normal touch is ~24px in size
    - 1.0 is the current "depth"
- press harder, touch will grow to ~38px
  - 58% increase, 1.58 would be the new "depth"

HAPTIC, TAPTIC, TOMATO, TOMATO

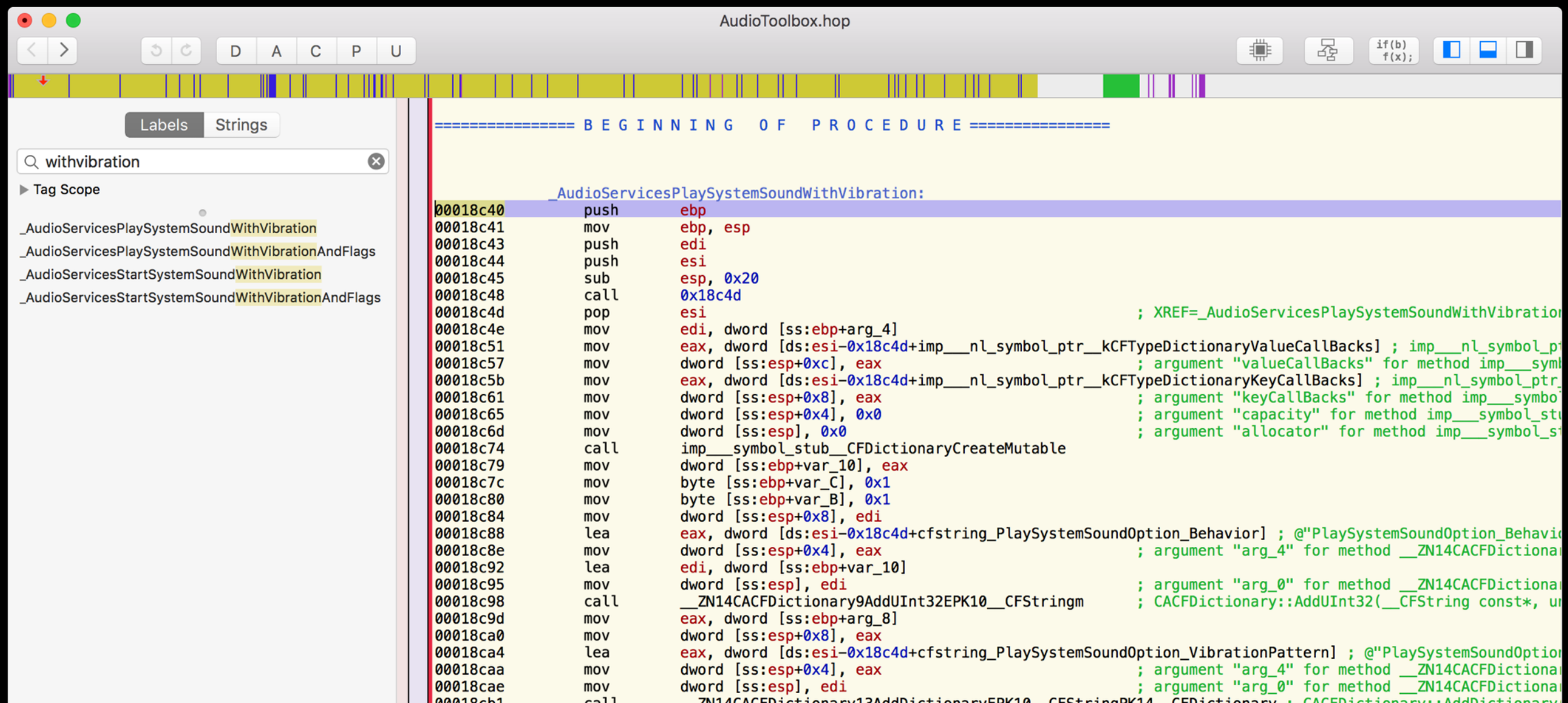
- Taptic Feedback™ comes with 3D touch
- same as WATCH
- can't really replicate it
- but we can fake it using haptics!

AUDIO SERVICES

- AudioServicesPlayAlertSound(kSystemSoundID_Vibrate)
  - too long, 0.2s
- let's find something else...
  - c function, class-dump won't work
  - let's open Hopper!

AUDIO TOOLBOX

- disassembling AudioToolbox gives us something
  - AudioServicesPlaySystemSoundWith**Vibration**()



AUDIO SERVICES

let's implement that...

tldr:

```
24 void PDPseudo3DTouchPlayTap() {
25   NSArray *vibrationPattern = @[
26                                 @YES,  // YES to vibrate
27                                 @100,  // 100ms
28                                 ];
29
30   NSDictionary *dictionary = @{
31                               @"Intensity" : @1.0,
32                               @"VibePattern" : vibrationPattern,
33                               };
34
35   AudioServicesPlaySystemSoundWithVibration(0xFFF, nil, dictionary);
36 }
```

: D

DEMO

this is what a hacker looks like... apparently...

SUMMARY

- do use/explore Private API to make cool demos
  - abuse it when you can!
- don't ship Private API code publicly
- do make really awesome prototypes
- don't say no because something is difficult
- do act ahead of the curve
- do make cool stuff

“A smile is a curve that sets everything straight.”

–PHYLLIS DILLER

:)

QUESTIONS?