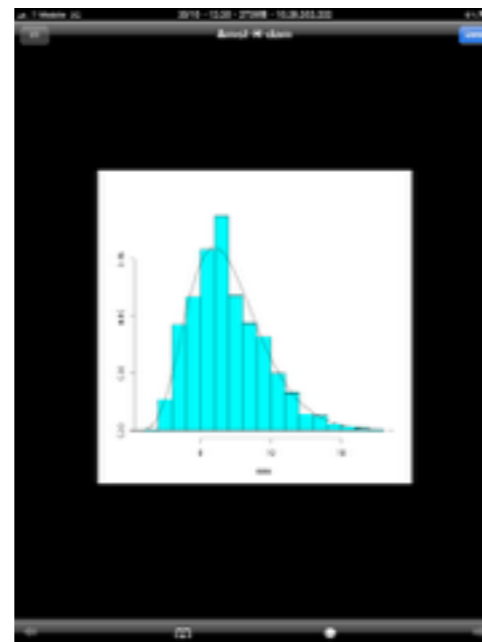


Data Science NL Meetup  
Utrecht, 23 January 2014

# -fun in Utrecht

 Richard Gill

<http://www.math.leidenuniv.nl/~gill>



(R on an iDevice)

# R on iOS ?

Sure, thanks to ech0chrome



- <http://leafmoon.users.sourceforge.net/cydia/>
- <http://twitter.com/#!/ech0chrome>
- Taiju Yamada <[ech0chrome@104.net](mailto:ech0chrome@104.net)>

# R on iOS



- First jailbreak iDevice – gain root privileges and circumvent Apple restrictions (your legal right, AFAIK)
- Jailbreak restores hidden functionality and installs Cydia (App Store for lots more)
- Apple doesn't (yet) see difference & device can be restored to original state – no loss of warranty

# Why jailbreak an iThing?

- iPhone, iPad speed, memory, storage, monitor (number of pixels) of typical 10 years old desktop, plus...
  - Internal mobile internet modem (3G cell phone)
  - Bluetooth, Wireless, USB connections...
  - Gorgeous GUI on top of a (BSD) UNIX
- Apple treats you like a child
- **Why climb Everest? Because it's there**

# Jailbreaking

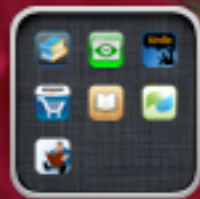
- At time of writing: works on all iDevices running iOS 7; not difficult or risky AFAIK (but make a backup first!)
  - Run evasi0n 7 on Mac or PC connected by USB
  - Uses known CPU architecture & vulnerabilities in Apple's boot process
- Note: the next generation will have new initially unknown architectures
- Next upgrade of iOS 7 might well remove currently exploited vulnerability
- Downgrading a currently installed iOS is essentially impossible
- Last upgrade of earlier iOS essentially makes earlier exploits impossible

# Jailbreaking iPad2, iOS 7.0.4

- Backup; download evasi0n7; connect and run
- Install OpenSSH and change passwords (alpine) of root and of user (mobile)
- Install more cool stuff and useful tools
- You can't upgrade iOS
- You can re-install iOS, and then restore your personal stuff from iTunes backup (jailbreak lost)



Cloud



eBooks



Social



Travel



News

Cydia



Cydia

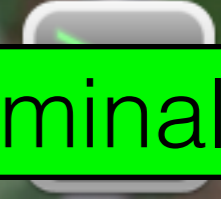


iFile

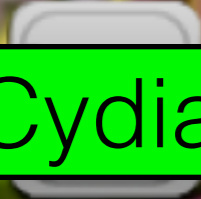


Terminal

Terminal



iSSH



AptBackup



WinterBoard



My3G



MyWi 5.0

Finder



DisplayRecorder



ScreenSplitr

I'm a mobile wireless hotspot



iEdit



OpenStreamer



iBrowser



iFileFinder



Settings



Mail



Safari

# Cydia "Installed"

22/10 - 11:32 - 221MB - 10.27.22.240 22% [🔋]

Installed

O

- OpenStreamer (Like VLC)** from ZodTTD & MacCiti (Multimedia) ✓  
The new media player for iDevices!

P

- PAM (Apple)** from Cydia/Telesphoreo (Administration) ✓  
pluggable (comples) authentication modules
- PAM Modules** from Cydia/Telesphoreo (Administration) ✓  
standard Apple authentication modules
- pcre** from Cydia/Telesphoreo (Development) ✓  
Perl-compatible regular expressions
- PDF Patcher 2** from BigBoss (Tweaks) ✓  
Fixes the main JailbreakMe 3.0 vulnerability
- pincrush** from Cydia/Telesphoreo (Utilities) ✓  
pincrush is an open, cross-platform alternative to Apple's proprietary PNG mangler, to optimize PNGs for display...
- png** from Cydia/Telesphoreo (Multimedia) ✓  
library for manipulating PNG files
- PreferenceLoader** from BigBoss (System) ✓  
load preferences in style
- Profile Directory** from Cydia/Telesphoreo (Administration) ✓  
makes packaging for /etc/profile reasonable
- pthread-stubs** from Cydia/Telesphoreo (X Window) ✓  
fills in missing pthread prototypes

R

- R the statistical language** from ech0chrome iPhone Repo (Scripting) ✓  
The R Project for Statistical Computing, along with littler Not with Rgui(R.app)...
- readline** from Cydia/Telesphoreo (Development) ✓

Cydia Sections Changes Installed Sources Search

19/10 - 4:07 - 166MB - 132.229.232.160 - miguest 24% [🔋]

Installed

R

- Reset Safari for SBSettings** from BigBoss (Addons) ✓  
An SBSettings Add-On to reset MobileSafari. MobileSafari will first be terminated before its cache, history and ta...
- RetinaPad** from BigBoss (Tweaks) ✓  
Enable Retina Display for iPhone apps on iPad
- Rotation Inhibitor** from BigBoss (System) ✓  
Disable device rotation with toggle for SBSettings

S

- Safari Download Manager** from BigBoss (Networking) ✓  
A full Download Manager for Mobile Safari.
- sandcastle** from BigBoss (Development) ✓  
Access nearly every directory from a sandboxed application
- SBSettings** from BigBoss (System) ✓  
Move common toggles directly into springboard where they're always there!
- sbsettingstoggles** from BigBoss (Addons) ✓  
These are the built in toggles for the SBSettings app.
- ScreenSplitr** from BigBoss (Utilities) ✓  
Mirror screen. TV w/ A/V Cable, or iDemo
- sed** from Unknown / Local (Utilities) ✓  
edits stream of text using patterns
- Serious SBSettings HD** from BigBoss (Themes) ✓  
Retina / HD SBSettings theme for SBSettings
- shell-cmds** from Cydia/Telesphoreo (Administration) ✓  
killall, mktemp, renice, time, which
- Simulated Key Events** from Cydia/Telesphoreo (Development) ✓  
enforces support for injecting keypresses

Cydia Sections Changes Installed Sources Search



```
RichPad:~ mobile$ ls
```

```
Applications/ Documents/ Library/ Media/
```

```
RichPad:~ mobile$ R
```

```
R version 2.10.1 (2009-12-14)
```

```
Copyright (C) 2009 The R Foundation for Statistical Computing
```

```
ISBN 3-900051-07-0
```

```
R is free software and comes with ABSOLUTELY NO WARRANTY.  
You are welcome to redistribute it under certain conditions.  
Type 'license()' or 'licence()' for distribution details.
```

```
  Natural language support but running in an English locale
```

```
Type 'demo()' for some demos, 'help()' for on-line help, or  
'help.start()' for an HTML browser interface to help.
```

```
Type 'q()' to quit R.
```

```
> 1+1
```

```
[1] 2
```

```
> set.seed(11091951)
```

```
> library(MASS)
```

```
> pdf("Amst-R-dam.pdf")
```

```
> truehist(rgamma(1000,7))
```

```
> x<-seq(from=0,to=30,length=400)
```

```
> lines(x,dgamma(x,7))
```

```
> graphics.off()
```

```
> q()
```

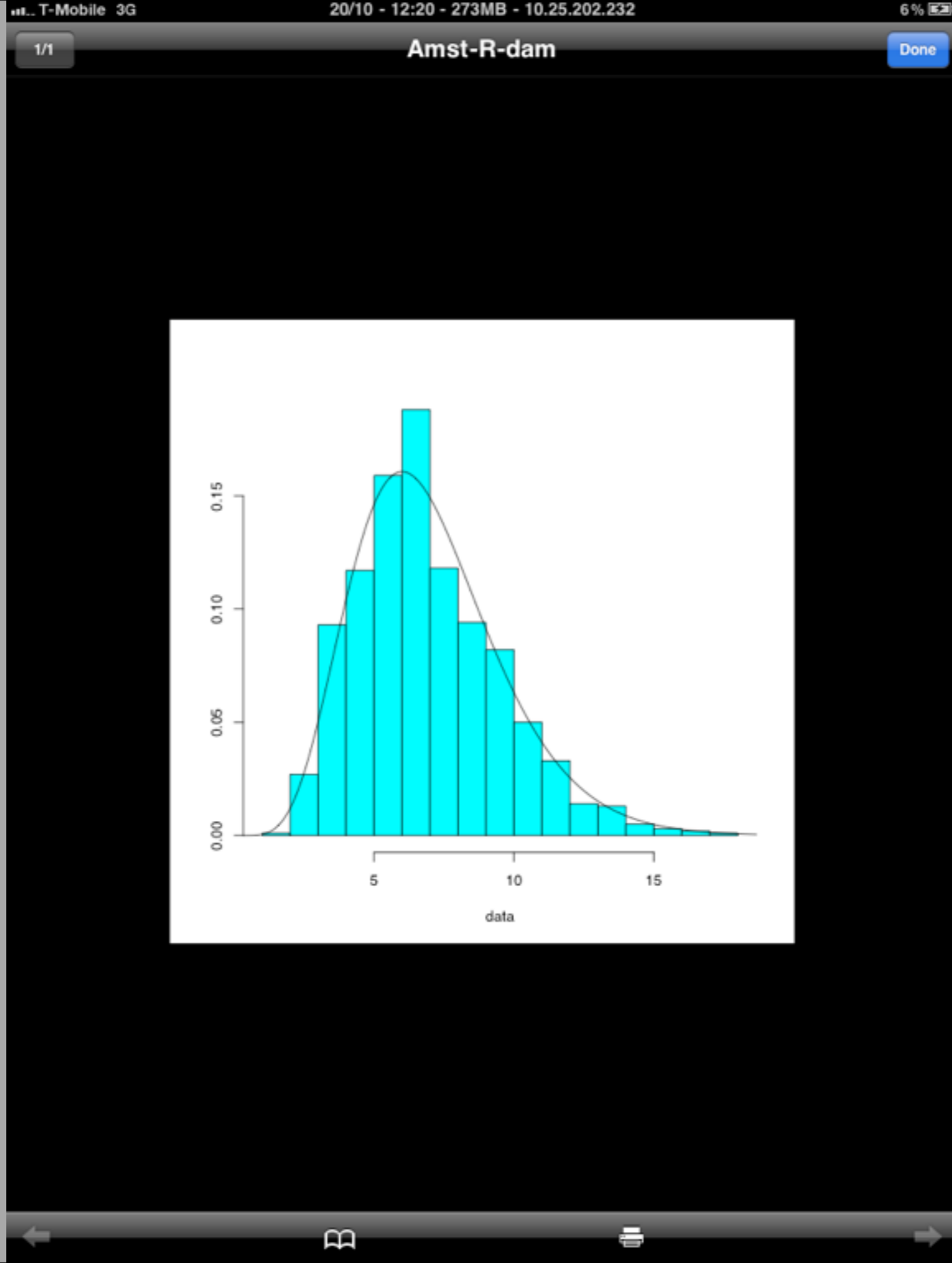
```
Save workspace image? [y/n/c]: n
```

```
RichPad:~ mobile$ ls
```

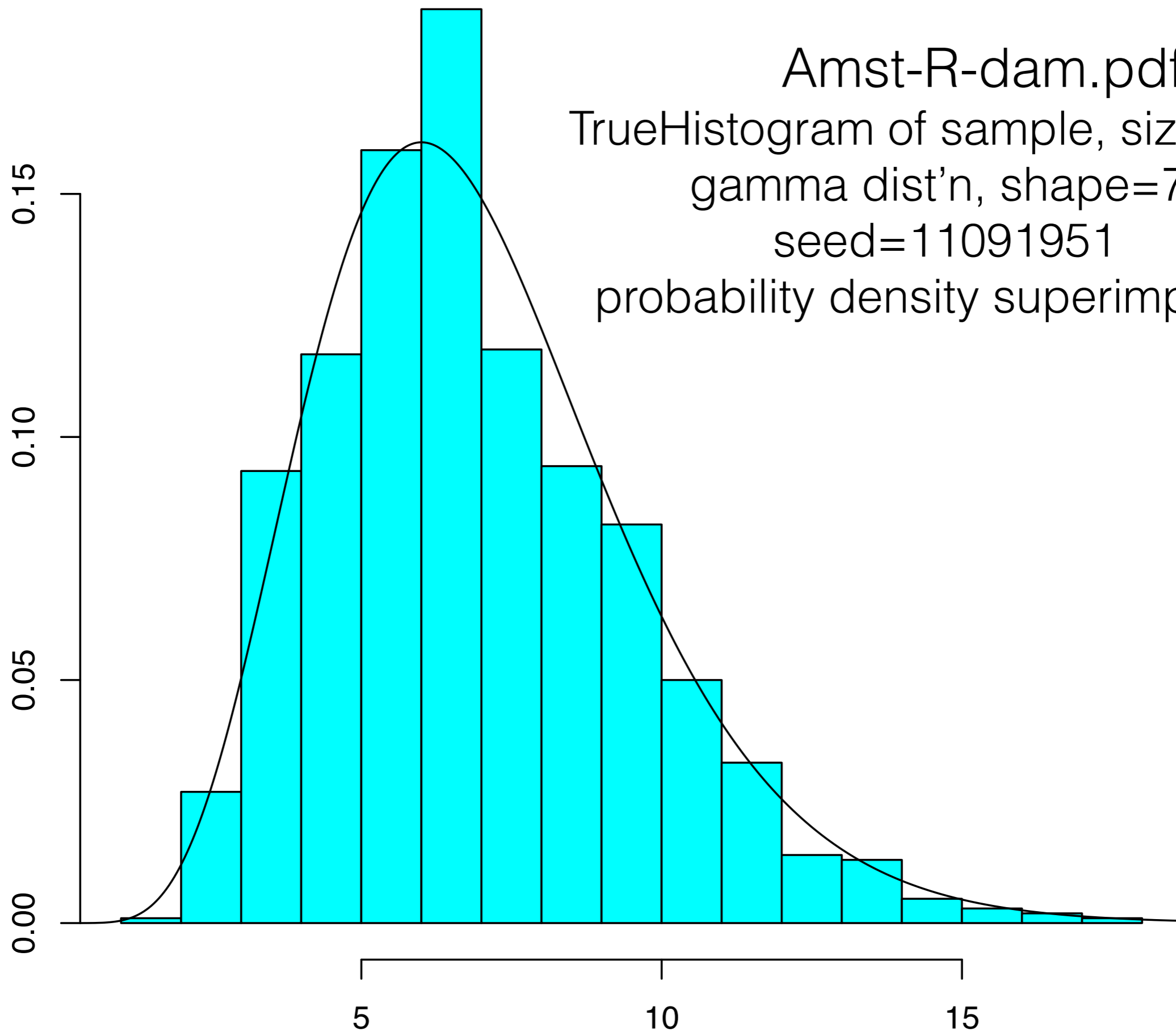
```
Amst-R-dam.pdf Applications/ Documents/ Library/ Media/
```

```
RichPad:~ mobile$ █
```

Open in  
pdf -  
viewer  
from  
Finder



Amst-R-dam.pdf  
TrueHistogram of sample, size 1000  
gamma dist'n, shape=7,  
seed=11091951  
probability density superimposed



“truehist” from library MASS, all options default

# Have fun!

- Remember to change the passwords of root and of mobile from alpine to ...
- Be prepared for annoyance as Apple, hackers, play cat and mouse
- Beware of scams and rumours, don't pay anyone anything!
- Don't count on jailbreak still being possible a few models / iOS versions later

# Postscript (1)

- Why I don't use it much: can't install extra libraries; touchscreen iOS keyboard has no tab, ctrl, arrow keys...
- Apple has made life of a non-standard developer almost impossible (code signing, ...)
- Should you develop on the iDevice or outside?
- If you've got internet, why not do R in the cloud?
- RStudio Server ... !  
(but: a bug presently prevents effective use from iDevice)

# Postscript (2)

- <http://gamma-level.com/iphoneos/ports/texlive> (Aaron Griffith) provides Cydia-based install of LaTeX
  - Just needs Perl from <http://coredev.nl/>
  - iOS hard disk has small partition for system, large partition for user. But you can move, symlink /usr/local (system partition) to /private/var/local (user partition), see <http://coredev.nl/>
- Griffith also explained how he made his own build, could be useful ... !
- However these instructions don't work on latest iOS



Terminal



iFile



R inside

The End



App Store



Cydia