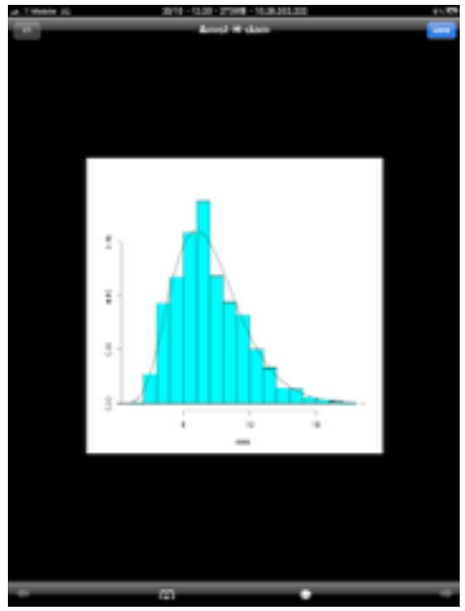
Data Science NL Meetup
Utrecht, 23 January 2014

R-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>

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)

Cydia

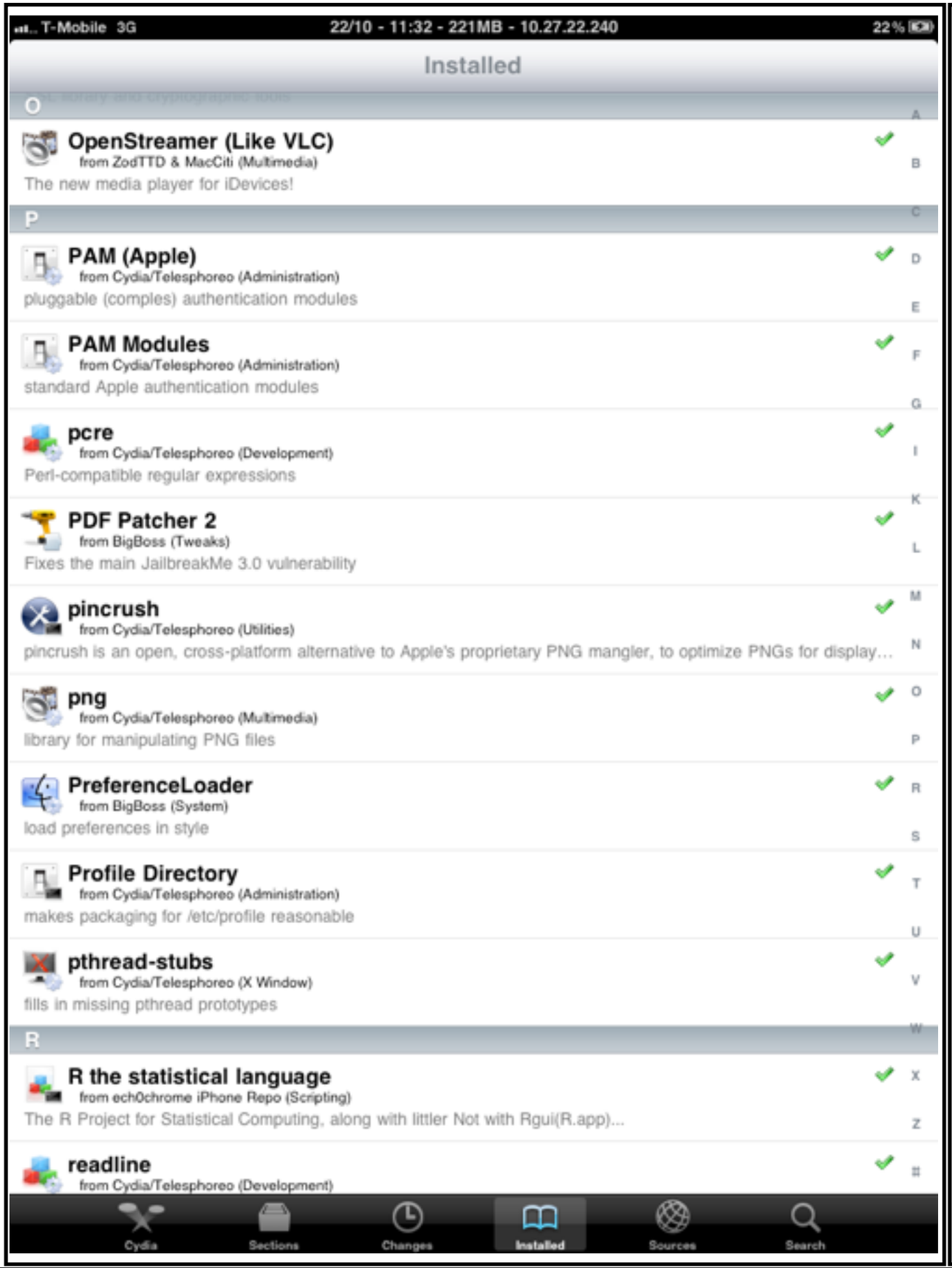
Terminal

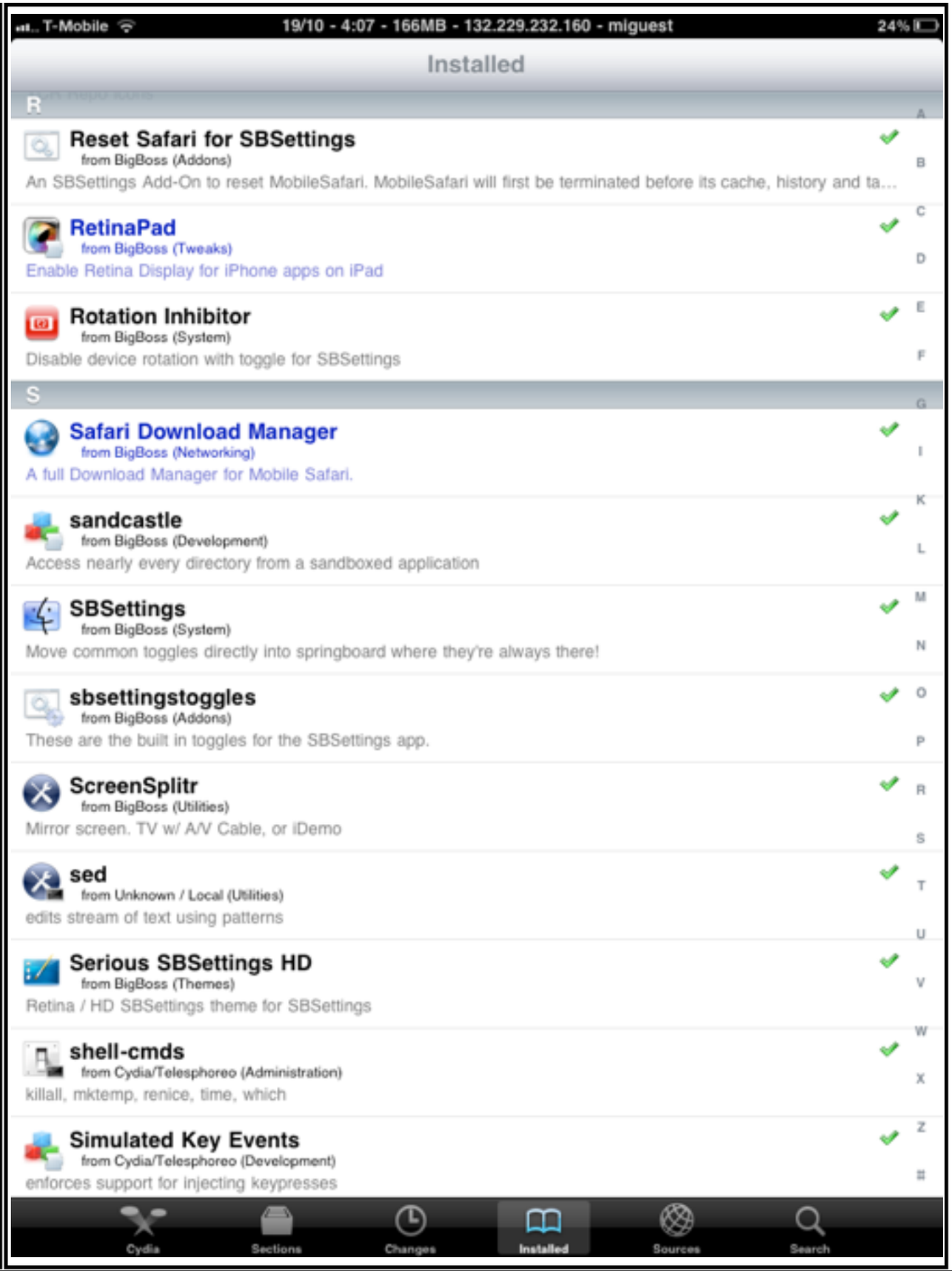
Finder

I'm a mobile wireless hotspot

Cloud
eBooks
Social
Travel
News
AptBackup
Cydia
iFile
Terminal
iSSH
WinterBoard
MyWi 5.0
ScreenSplitr
iEdit
OpenStreamer
iBrowser
iFileFinder
Settings
Mail
Safari

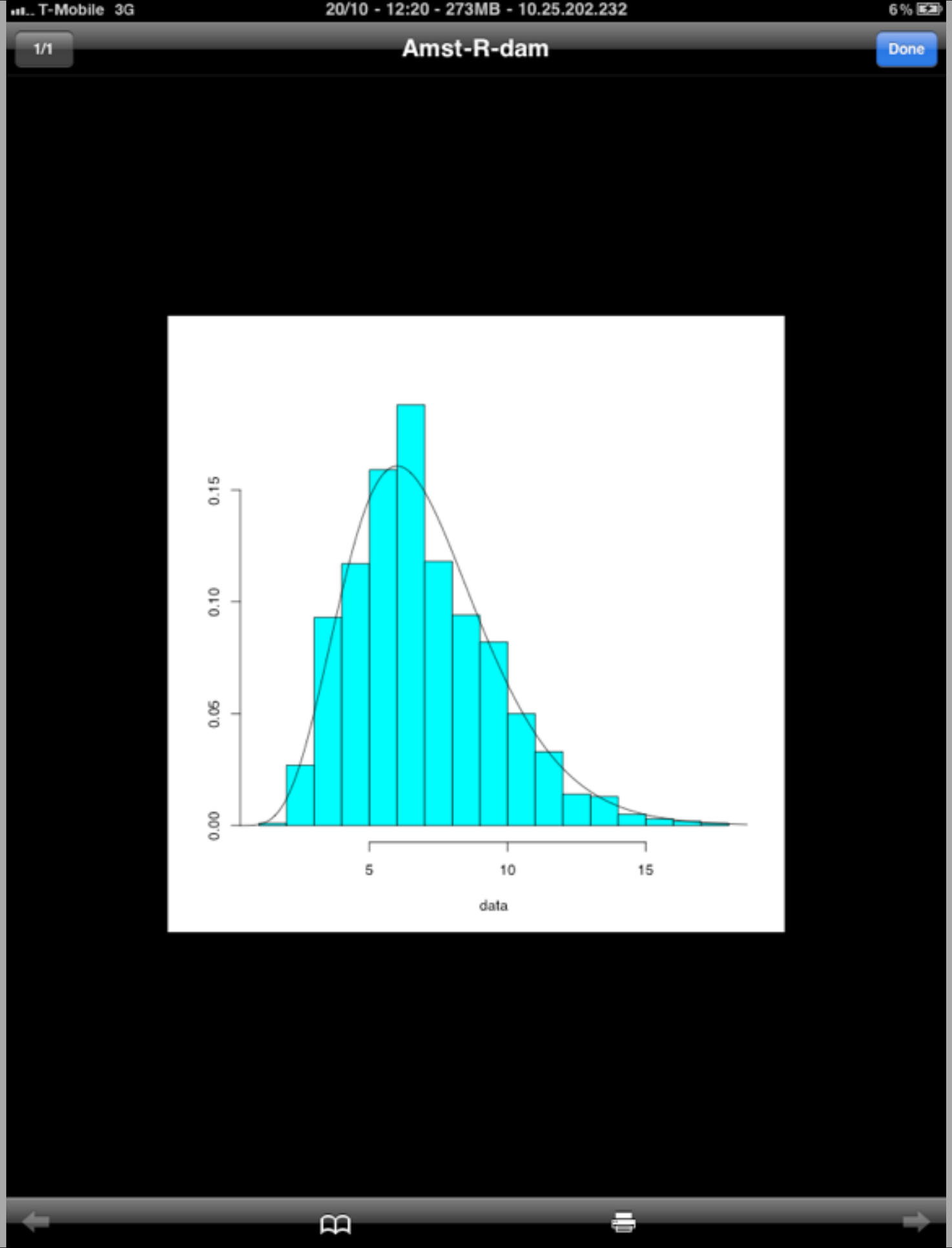
Cydia “Installed”





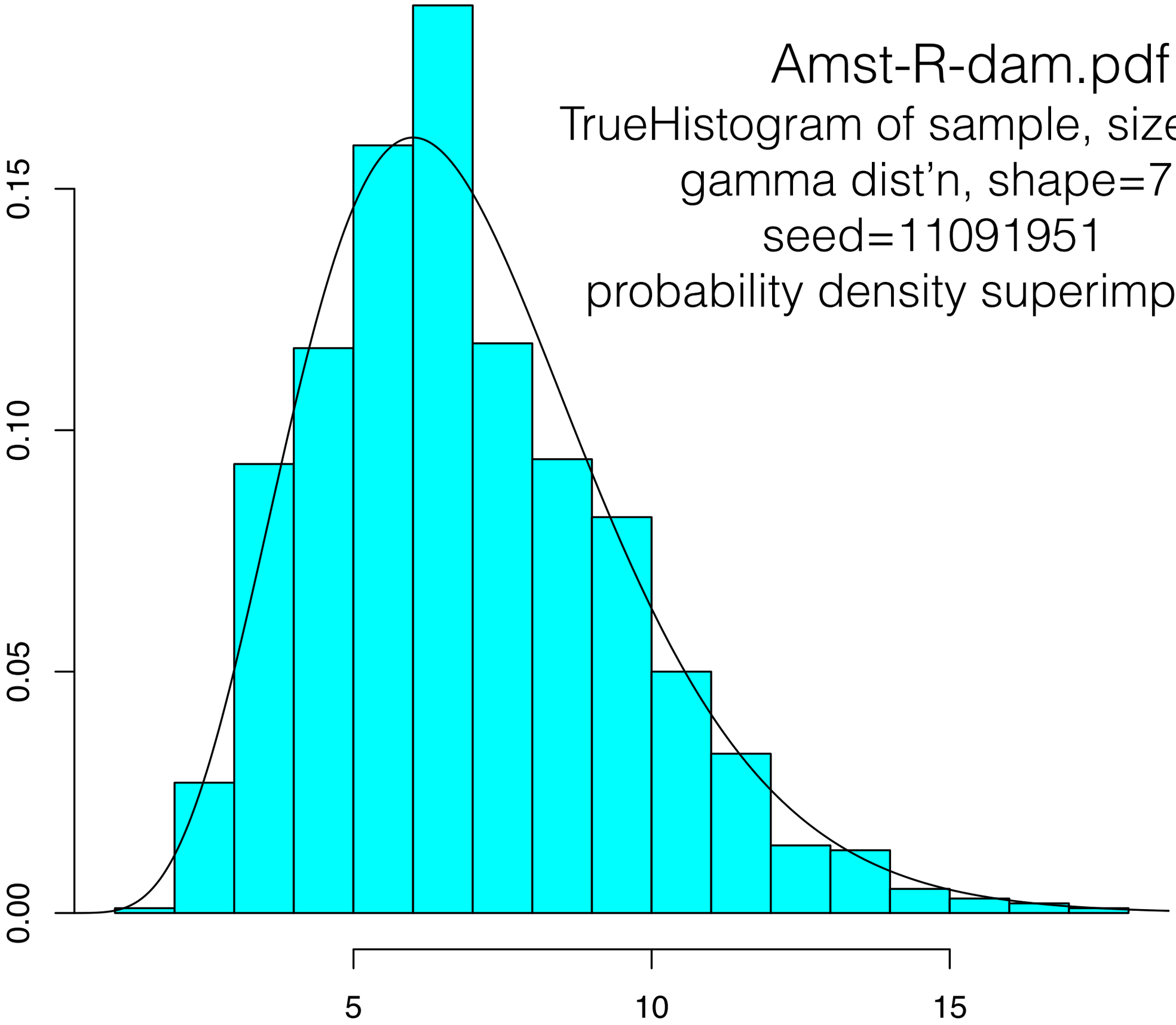
```
RichPad:~ mobile$ ls
Applications/  Documents/  Library/  Media/
RichPad:~ mobile$ R

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