fun in Amst-R-dam

Richard Gill
http://www.math.leidenuniv.nl/~gill

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1: Reverse-engineering the VVS logo
   2: R on iPhone or iPad

Updates: 27 January 2012, 3 July 2012
(see end of each section)
Part 1: The VVS logo

Original art-work: **Tobias Baanders**, ca. 1970 (pen and ink)
Current version: scanned image converted to postscript, 1996
large deviations and asymptotic efficiencies

P. Groeneboom

Censoring and Stochastic Integrals

Richard Gill
421 lines of postscript
My Modern Applied Statistics Course Assignment:
Fit a smooth family of curves with parsimonious description

No-one ever succeeded
I didn’t either
Insight

• It’s a perspective image of a 3-d object: “9 parallel race tracks”

• To the right, they go over a sort-of normally shaped hill,

• viewpoint is close from above

• To the left they flatten out, then they curve back and recede into the distance

• Let’s draw the 18 strip-edges in 3d
My solution:

The ground plan
My solution:

The front view
My solution:

Gamma(7) probability densities (right to left)

The front view

Earlier version had flat bottom – half a straight onion instead of a whole bent onion – but did not fit data so well
Live Demo
(download and run in R)

• Try it out: R script
  http://www.math.leidenuniv.nl/~gill/3dlogo.txt

• **rgl** package creates one rotatable 3d closed curve

• *Earlier version* had 9 black strips obtained by drawing many lines connecting opposite sides

• *Earlier version* had more simple code and more beautiful object but not so close to desired end result

• I’m a bad programmer so I don’t have it any more (but I could easily make it again)
Postprocessing

• Fill the 9 strips for final scalable image:
  Export rgl image to svg, “ungroup” object & “join” many, many(!) pieces to one closed line in *Illustrator*. Save as postscript, fill closed line. Convert to svg or pdf or (nonscalable) jpeg ...

• There **must** be an easy way to end up with **nine** scalable **filled closed curves**

• **Must** make R description shorter while still fitting data (front view: half a straight onion)

• I’ll give a prize to the person who can do this
• I later asked Tobias Baanders what the idea had been for his design
  • Answer: he had 3-d perspective image in mind
• Long ago (when I was richard@mcvax.nl) I once had the following Unix motd:
  “life is like an onion: you peel off layer after layer only to find there’s nothing inside”
  • My philosophy: it’s between the layers where you find the meaning of life

End of part 1
Postscript to Part I

• Finally, my “solution” does not use statistics much, and why should it? We can now create more beautiful logos, and all kinds of variant logos

• Try again with Sage, http://www.sagemath.org/
Free open source mathematics system, combining existing open-source packages into a common Python-based interface, slowly becoming a viable alternative to Magma, Maple, Mathematica and Matlab

• Sage has interfaces to R and LaTeX
Part 2: R on iOS?
Sure, thanks to ech0chrome

- [http://leafmoon.users.sourceforge.net/cydia/](http://leafmoon.users.sourceforge.net/cydia/)
- [http://twitter.com/#!/ech0chrome](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)
- 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 (smaller 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

- On earlier iDevices and even latest iOS not difficult or risky (but make a backup first!).
  - Run greenpoison / redsn0w / limeraIn on Mac or PC with iTunes, connected by USB
  - Uses known CPU architecture & vulnerabilities in Apple’s boot process

- Alas, iPad2 and iPhone 4S have new secret Apple CPU
  - Only known jailbreak exploits bug in pdf display fixed above iOS 4.3.3
  - Downgrading your currently installed iOS is impossible
Jailbreaking iPad2, iOS 4.3.3

- Safari to Comex’s http://www.jailbreakme.com
- Install-button is a link to a pdf file which Safari tries to view, crashing iOS
- In ensuing chaos, Cydia etc. is installed (from the “pdf” file)
- Install OpenSSH and change passwords (*alpine*) of root and of user (*mobile*)
- Install Comex’ patch of the pdf bug from Cydia
- Don’t upgrade iOS – jailbreak lost, no going back
JailbreakMe is the easiest way to free your device. Experience iOS as it could be, fully customizable, themeable, and with every tweak you could possibly imagine.

Safe and completely reversible (just restore in iTunes), jailbreaking gives you control over the device you own. It only takes a minute or two, and as always, it's completely free.

Please make an iTunes backup before jailbreaking.

Cydia
Jay Freeman (saurik)
Jailbreak by comex.

More Information
Tell a Friend

This jailbreak was brought to you by comex, with the help of Grant Paul (chpwn), Jay Freeman (saurik), MuscleNerd, and many others. Please don't use this for piracy. Donate?

Legal
JailbreakMe is the easiest way to free your device. Experience iOS as it could be, fully customizable, themeable, and with every tweak you could possibly imagine.

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Cydia
Jay Freeman (saurik)
Jailbreak by comex.

INSTALL

Cydia
Jay Freeman (saurik)
Jailbreak by comex.

More Information

Tell a Friend

This jailbreak was brought to you by comex, with the help of Grant Paul (chpwn), Jay Freeman (saurik), MuscleNerd, and many others. Please don't use this for piracy. Donate?

Legal
Oops...

Note: If Cydia started to install, then disregard this and click here. :p

Looks like the hack didn’t work. If you’re already jailbroken, do you have PDF Patcher 2 installed?

Otherwise, email me.
Cydia

I'm a mobile wireless hotspot

Terminal

Finder
## Cydia “Installed”, from O to S

<table>
<thead>
<tr>
<th>Installed</th>
<th>Installed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OpenStreamer (Like VLC)</strong></td>
<td>from BigBoss (Advisory)</td>
</tr>
<tr>
<td>The new media player for iDevices!</td>
<td>✓</td>
</tr>
<tr>
<td><strong>PAM (Apple)</strong></td>
<td>from Cydia/Telephonos (Administration)</td>
</tr>
<tr>
<td>pluggable (complex) authentication modules</td>
<td>✓</td>
</tr>
<tr>
<td><strong>PAM Modules</strong></td>
<td>from Cydia/Telephonos (Administration)</td>
</tr>
<tr>
<td>standard Apple authentication modules</td>
<td>✓</td>
</tr>
<tr>
<td><strong>pcrer</strong></td>
<td>from Cydia/Telephonos (Development)</td>
</tr>
<tr>
<td>Perl-compatible regular expressions</td>
<td>✓</td>
</tr>
<tr>
<td><strong>PDF Patch 2</strong></td>
<td>from BigBoss (Tweaks)</td>
</tr>
<tr>
<td>Fixes the main JailbreakMe 3.0 vulnerability</td>
<td>✓</td>
</tr>
<tr>
<td><strong>pincrush</strong></td>
<td>from Cydia/Telephonos (Utilities)</td>
</tr>
<tr>
<td>pincrush is an open, cross-platform alternative to Apple’s proprietary PNG manager, to optimize PNGs for display...</td>
<td>✓</td>
</tr>
<tr>
<td><strong>png</strong></td>
<td>from Cydia/Telephonos (Multimedia)</td>
</tr>
<tr>
<td>Library for manipulating PNG files</td>
<td>✓</td>
</tr>
<tr>
<td><strong>PreferenceLoader</strong></td>
<td>from BigBoss (System)</td>
</tr>
<tr>
<td>load preferences in style</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Profile Directory</strong></td>
<td>from Cydia/Telephonos (Administration)</td>
</tr>
<tr>
<td>makes packaging for /etc/profile reasonable</td>
<td>✓</td>
</tr>
<tr>
<td><strong>pthread-stubs</strong></td>
<td>from Cydia/Telephonos (X Window)</td>
</tr>
<tr>
<td>填补了 missing pthread prototypes</td>
<td>✓</td>
</tr>
<tr>
<td><strong>R</strong></td>
<td>from Cydia/Telephonos (Development)</td>
</tr>
<tr>
<td>The R project for statistical computing, along with little Not with Rgui(R.app)...</td>
<td>✓</td>
</tr>
<tr>
<td><strong>readline</strong></td>
<td>from Cydia/Telephonos (Development)</td>
</tr>
<tr>
<td>✓</td>
<td></td>
</tr>
<tr>
<td><strong>ScreenSplitr</strong></td>
<td>from BigBoss (Utilities)</td>
</tr>
<tr>
<td>Mirror screen. TV via AV Cable, or iDemo</td>
<td>✓</td>
</tr>
<tr>
<td><strong>sed</strong></td>
<td>from Unknown / Local (Utilities)</td>
</tr>
<tr>
<td>edits stream of text using patterns</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Serious SBSettings HD</strong></td>
<td>from BigBoss (Themes)</td>
</tr>
<tr>
<td>Retina / HD SBSettings theme for SBSettings</td>
<td>✓</td>
</tr>
<tr>
<td><strong>shell-cmds</strong></td>
<td>from Cydia/Telephonos (Administration)</td>
</tr>
<tr>
<td>kilat, kilatemp, renio, etc., which</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Simulated Key Events</strong></td>
<td>from Cydia/Telephonos (Development)</td>
</tr>
<tr>
<td>enforces support for injecting keypresses</td>
<td>✓</td>
</tr>
</tbody>
</table>

**Reset Safari for SBSettings**
An SBSettings Add-On to reset MobileSafari. MobileSafari will first be terminated before its cache, history and... | ✓

**RetinaPad**
Enable Retina Display for iPhone apps on iPad | ✓

**Rotation Inhibitor**
Disable device rotation with toggle for SBSettings | ✓

**Safari Download Manager**
A full Download Manager for Mobile Safari. | ✓

**sandcastle**
Access nearly every directory from a sandboxed application | ✓

**SBSettings**
Move common toggles directly into springboard where they’re always there! | ✓

**sbbsettingstoggles**
These are the built in toggles for the SBSettings app. | ✓

**ScreenSplitr**
Mirror screen. TV w/ AV Cable, or iDemo | ✓

**sed**
Edits stream of text using patterns | ✓

**Serious SBSettings HD**
Retina / HD SBSettings theme for SBSettings | ✓

**shell-cmds**
Kilat, kilatemp, renio, etc., which | ✓

**Simulated Key Events**
Enforces support for injecting keypresses | ✓
Jailbreak enables download of arbitrary files by Safari & from mail attachments by Mail – both disabled by Apple!

Alternatively, build R yourself!

Problem: R wants `jpeg` aka `libjpeg` for plot to .jpg file (so what: plot to pdf)

echo0chrome’s R wants his v.7; some Cydia apps want Cydia’s v.6.

Work-around: enable repo, install dependencies (except `libjpeg`) by Cydia

Download echo0chrome’s R-installer, install R from terminal with `--force-depends` (overrides dependency failures)

```
RichPad:- mobile$ cd Med*
RichPad:-/Media mobile$ cd Dow*
RichPad:-/Media/Downloads mobile$ ls Jpeg/
com.ech0chrome.R 2.10.1-1.deb
com.ech0chrome.libgfortran 4.2-3.1.2-2.deb
com.ech0chrome.libmpfr_2.4.1-2.deb
com.ech0chrome.xzutil 4.999.9-2.deb
jpeg_6b-1_iphonesos-arm.deb
RichPad:-/Media/Downloads mobile$ ls Jpeg
com.ech0chrome.libjpeg 7-2.deb
RichPad:-/Media/Downloads mobile$ sudo dpkg --force-depends --i *R*
```

Password:

Selecting previously deselected package com.ech0chrome.r.
(Reading database ... 6553 files and directories currently installed.)
Unpacking com.ech0chrome.r (from com.ech0chrome.R 2.10.1-1.deb) ...
dpkg: com.ech0chrome.r: dependency problems, but configuring anyway as you request:

```
com.ech0chrome.r depends on com.ech0chrome.libjpeg; however:
  Package com.ech0chrome.libjpeg is not installed.
Setting up com.ech0chrome.r (2.10.1-1) ...
```

```
RichPad:-/Media/Downloads mobile$ R
```

R version 2.10.1 (2009-12-14)
Copyright (C) 2009 The R Foundation for Statistical Computing
ISBN 3-900051-07-0

Good guys The bad guy
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
Applications/  Documents/  Library/  Media/
RichPad:~ mobile$ ls
Amst-R-dam.pdf  Applications/  Documents/  Library/  Media/
RichPad:~ mobile$ ls
Open in pdf - viewer from Finder
TrueHistogram of sample, size 1000
gamma dist’n, shape=7, seed=11091951
probability density superimposed

“truehist” from library MASS, all options default
Have fun!

• Now we wait for LaTeX on iOS

• 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 to Part 2

- iPad2, iPhone 4S (iOS 5.0.1) have jailbreak: “Absinthe”

- It’s (usually) fast and easy
  (do it alongside a good cup of coffee, relax)

- Don’t hurry, be careful. **Backup** over iTunes, allow time for iOS **Restore** (needs internet connection to Apple!) *just in case* something goes wrong

- Do before release of next revision of iOS:
  Apple only allows “Restore” to **latest version** of iOS
Postscript to Part 2 (continued)

- [http://gamma-level.com/iphoneos/ports/texlive](http://gamma-level.com/iphoneos/ports/texlive) (Aaron Griffith) provides Cydia-based install of LaTeX

- Just needs Perl from [http://coredev.nl/](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/](http://coredev.nl/)

- Griffith also explains how to make your own build, could be useful for learning how to add Sage, ...!
Update 3 July 2012

- Now at iOS 5.1.1: jailbreak with redsn0w or absinthe

- R installation problem with "jpeg" incompatibility no longer exists

- New R incompatibility problem with "TruPrint" (v. useful Cydia app: print to pdf); solution, install R first, then TruPrint)

- LaTeX installs fine, note: TruPrint already moves and sim-links "local" to user partition. So if you have TruPrint, you can omit this step.

- After installation, the LaTeX executables need to be "signed". Aaron Griffiths: "iOS 5 is a little bit more strict about what executables it will run than older versions. The fix is pretty easy but I haven't had a chance to release a new version of my LaTeX packages. I've heard of this problem a few times now, so I've written a script which will pseudo-sign all the LaTeX executables so that they will run again. You'll need a tool called `ldid` to run this script; either install it through Cydia or run "apt-get install ldid" as root. Then download this script, and run it (also as root) http://gammalevel.com/forever/pseudosign-latex.sh. This script simply runs `ldid -S ...` on each LaTeX executable, which you could do manually if you want. There's a lot of them though, so the script is much more convenient."
The End