R is dope AF

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Contents

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R version: 3.5.0
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This document can be found at https://github.com/darwinanddavis/githubpres

R session info

```
R version 3.5.0 (2018-04-23)
Platform: x86_64-apple-darwin15.6.0 (64-bit)
Running under: OS X El Capitan 10.11.6

Matrix products: default
BLAS: /Library/Frameworks/R.framework/Versions/3.5/Resources/lib/libRblas.0.dylib
LAPACK: /Library/Frameworks/R.framework/Versions/3.5/Resources/lib/libRlapack.dylib

locale:
[1] en_US.UTF-8/en_US.UTF-8/en_US.UTF-8/C/en_US.UTF-8/en_US.UTF-8

attached base packages:
[1] stats     graphics  grDevices utils     datasets  methods   base

loaded via a namespace (and not attached):
 [1] compiler_3.5.0  backports_1.1.2 magrittr_1.5    rprojroot_1.3-2 tools_3.5.0     htmltools_0.3.6
 [7] pillar_1.2.3    tibble_1.4.2    yaml_2.2.0      Rcpp_1.0.0      stringi_1.2.3   rmarkdown_1.10
[13] knitr_1.20      stringr_1.3.1   digest_0.6.15   rlang_0.3.0.1   evaluate_0.10.1
```

Overview

This document showcases why `R` is **dope**.

You can write in-line `code` if you want to differentiate between when you are typing normally or highlighting `model parameters`, for example.

Equations like this $t' = \gamma(t - vx/c^2)$, to appear within text lines.

Create links to your website.

Make footnotes[1].

Use different headings

Like this subheading

Create quoted text

> Pump the bass in the trunk //
> It rattled like a baby hand //
> Except this toy cost 80 grand //
> And I'm crazy tan, from all the places that I've been //
> Just from writing words with a pen //

Just like LaTeX, but *more versatile.*

[1] Where the footnote goes here and it is automatically formatted

Define equations

Accordingly, we write the eigenfunction of a spinless particle as the superposition of plane wave states of momentum (π) and energy (Ej) having amplitudes $a(\pi, Ej)$

$$\phi n(r,t) = \sum_{i,j} a(p_i, E_j) e^{\frac{i}{h}(p_i \cdot r - E_j t)}$$

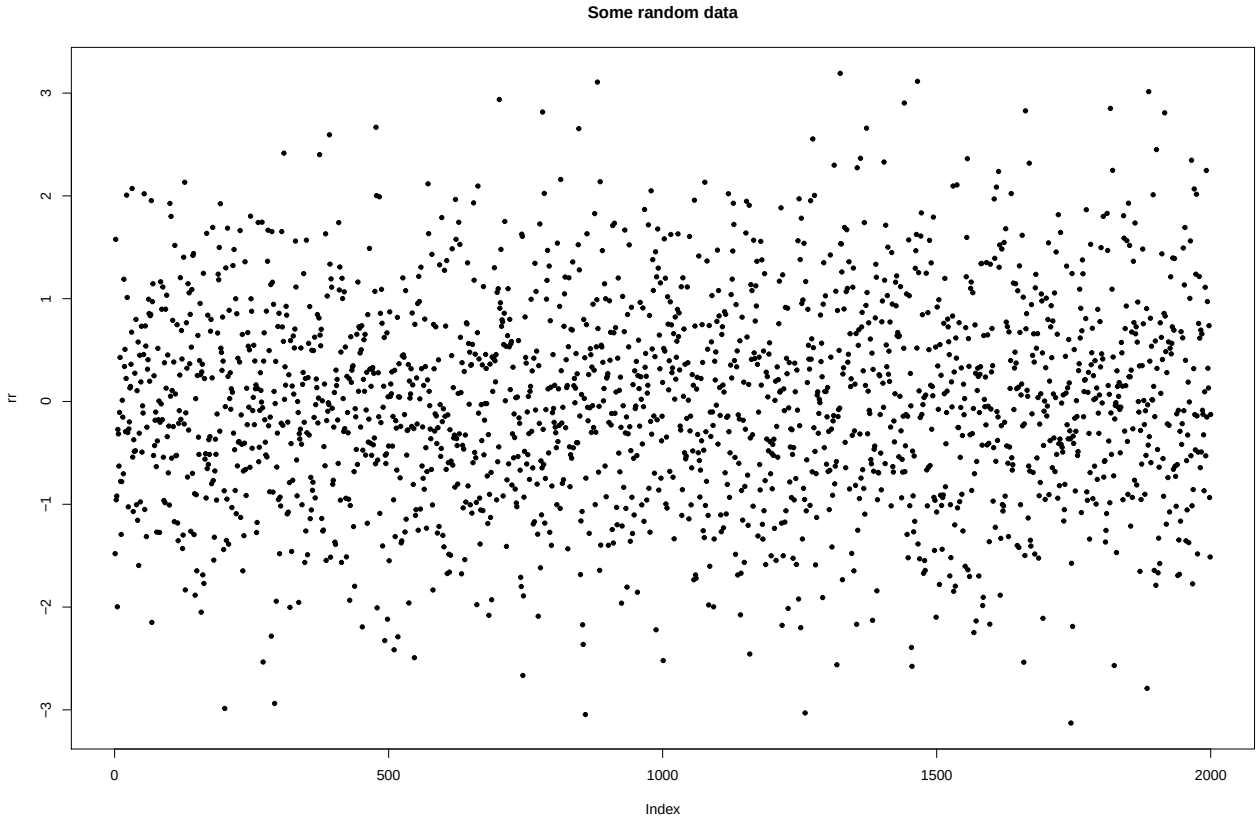
where, for convenience, we have suppressed the eigenfunction indices in $\phi n(r,t)$ and $an(\pi, Ej)$. Using periodic boundary conditions, the normalization of $\phi n(r,t)$ in (1) yields

$$\frac{1}{V_o T_o h^4} \int \phi \cdot (r,t)\phi(r,t) d^3 r dt = \sum a \cdot (p_i, E_j) a(p_i, E_j) = 1$$

Embed images/gifs:

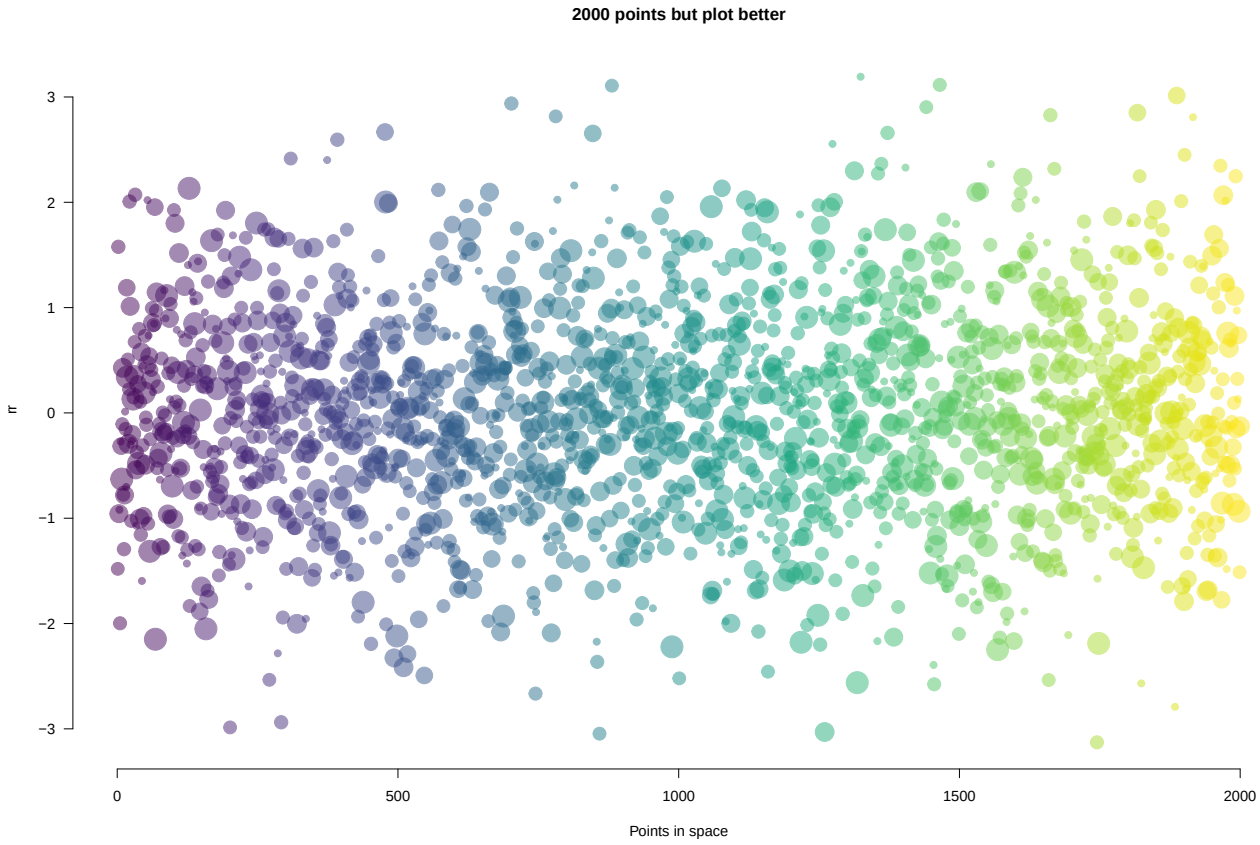
.

Create, alter, and imbed plots



Show plots with associated code

```
require(viridis)
bm <- 0
par(las=1,bty="n"); xlim <- c(-5,5);ylim <- c(0,0.5)
set.seed(12)
N <- 2000
rr <- rnorm(N); rr2 <- rnorm(N^2); rr3 <- rnorm(N+0.3)
rrd <- density(rr);rrd2 <- density(rr2);rrd3 <- density(rr3)
main <- paste0(N," points but plot better");xlab <- "Points in space"
if(bm==1){
  layout(matrix(c(rep(1,3),2:4), 2, 3, byrow = TRUE));sc <- 1
  plot(rr,las=1,bty="n",col=adjustcolor(viridis(N),0.5),pch=20,cex=runif(10,1,5),
       main=main,xlab=xlab)
for(r in list(rrd,rrd2,rrd3)){
  plot(r,xlim=xlim,ylim=ylim,main="")
  polygon(r,col=adjustcolor(viridis(250)[sc],0.5),border=viridis(250)[sc]);sc <- sc+100}
}else{par(mfrow=c(1,1))
  plot(rr,las=1,bty="n",col=adjustcolor(viridis(N),0.5),pch=20,cex=runif(10,1,5),
       main=main,xlab=xlab)}
```



And tables

Table 1. Definitions of model parameters for individual hosts and **parasites**. Dimensions and units: -, dimensionless; cm, centimetres; J, Joules; L, length.

Parameter	Definition	Dimension(unit)
L	structural length	cm
ee	scaled reserve density	J (cm^3)
D	host development	—
RH	energy in reproduction buffer	J

Embed code from different languages

This is R code

```r
if(pck==1){
  p<-c("rJava", "RNetLogo"); remove.packages(p)
  # then install rJava and RNetLogo from source
  install.packages("rJava", repos = "https://cran.r-project.org/")
  install.packages("RNetLogo", repos = "https://cran.r-project.org/")
}
```

shell/bash

```bash
echo "Hello Bash!"
pwd # check working dir
git init # initialise git
```

Octave (and MATLAB from the RMatlab package).

RMatlab documentation.

```
b = [4; 9; 2] # Column vector
A = [ 3 4 5;
      1 3 1;
      3 5 9 ]
x = A \ b     # Solve the system Ax = b
```

HTML

```html
<!-- links-->
        <div class="footer">
            <a href="dd_feed.html"
            class="transition fade_in">
                Latest post
            </a>
                 
            <a href="dd_contact.html"
            class="transition fade_in">
                Contact
            </a>
                 
            <a href="dd_subscribe.html"
            class="transition fade_in">
                Subscribe
            </a>
        </div>
```

CSS

```
body {
  color: red;
}
```

Javascript to access `html` and `css`

```
$('.title').css('color', 'red')
```

Python

```
x = 'hello, python world!'
print(x.split(' '))
```

Here's a complete list of available languages

```
names(knitr::knit_engines$get())
```

```
 [1] "awk"       "bash"      "coffee"    "gawk"      "groovy"    "haskell"   "lein"      "mysql"
 [9] "node"      "octave"    "perl"      "psql"      "Rscript"   "ruby"      "sas"       "scala"
[17] "sed"       "sh"        "stata"     "zsh"       "highlight" "Rcpp"      "tikz"      "dot"
[25] "c"         "fortran"   "fortran95" "asy"       "cat"       "asis"      "stan"      "block"
[33] "block2"    "js"        "css"       "sql"       "go"        "python"    "julia"
```

All from `R`!

References

Efthimiades, S., Physical meaning and derivation of Schrodinger and Dirac equations, Department of Natural Sciences, Fordham University. doi: d34464566.

Malishev, M., Bull, C. M., & Kearney, M. R. (2018). An individual-based model of ectotherm movement integrating metabolic and microclimatic constraints. Methods in Ecology and Evolution, 9(3), 472-489.