

# R is dope AF

Matthew Malishev<sup>1\*</sup>

<sup>1</sup> *Department of Biology, Emory University, 1510 Clifton Road NE, Atlanta, GA, USA, 30322*

## Contents

<b>Overview</b>	<b>3</b>
Use different headings . . . . .	3
Like this subheading . . . . .	3
<b>Just like L<sup>A</sup>T<sub>E</sub>X, but <i>more versatile</i>.</b>	<b>3</b>
Define equations . . . . .	4
Embed images/gifs: . . . . .	4
Create, alter, and embed plots . . . . .	5
Show plots with associated code . . . . .	6
And tables . . . . .	8
Embed code from different languages . . . . .	9
This is R code . . . . .	9
<b>shell/bash</b> . . . . .	9
Octave (and MATLAB from the <b>Rmatlab</b> package). . . . .	9
HTML . . . . .	9
CSS . . . . .	10
Javascript to access <b>html</b> and <b>css</b> . . . . .	10
Python . . . . .	10
Here's a complete list of available languages . . . . .	10
<b>All from R!</b>	<b>10</b>
References . . . . .	11

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R version: 3.5.0

\*Corresponding author: [matthew.malishev@gmail.com](mailto:matthew.malishev@gmail.com)

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 tools\_3.5.0 htmltools\_0.3.6 pillar\_1.3.1 rstudioapi\_0.7 tibble\_2.1.1  
[7] yaml\_2.2.0 crayon\_1.3.4 Rcpp\_1.0.2 rmarkdown\_1.14 knitr\_1.23 xfun\_0.8  
[13] digest\_0.6.20 pkgconfig\_2.0.2 rlang\_0.4.0 evaluate\_0.14

# 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<sup>1</sup>.

## 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 **L<sup>A</sup>T<sub>E</sub>X**, but *more versatile*.

---

<sup>1</sup>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 ( $\pi$ ) and energy ( $E_j$ ) having amplitudes  $a(\pi, E_j)$

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

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

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

Embed images/gifs:



## Create, alter, and embed plots

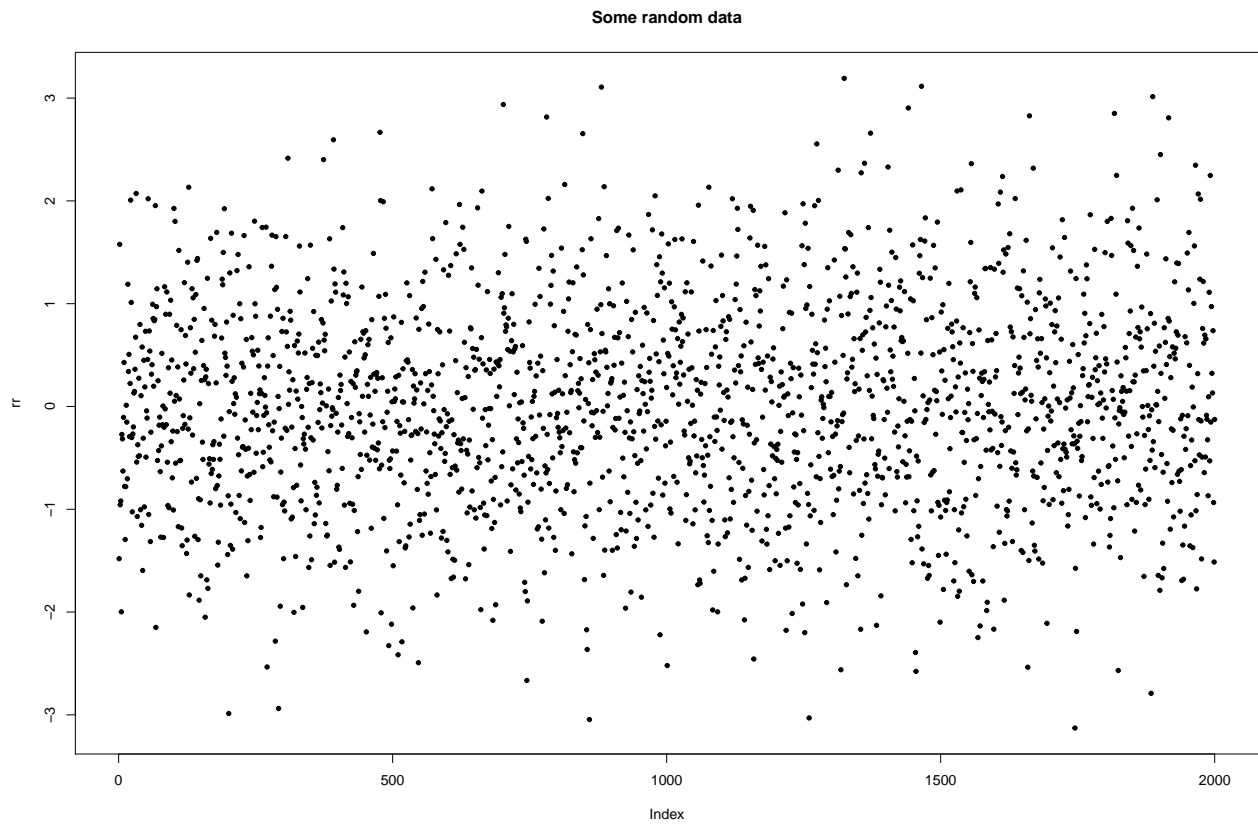


Figure 1. Example of a stock plot embedded into a PDF from RMarkdown.

## 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)
}
```

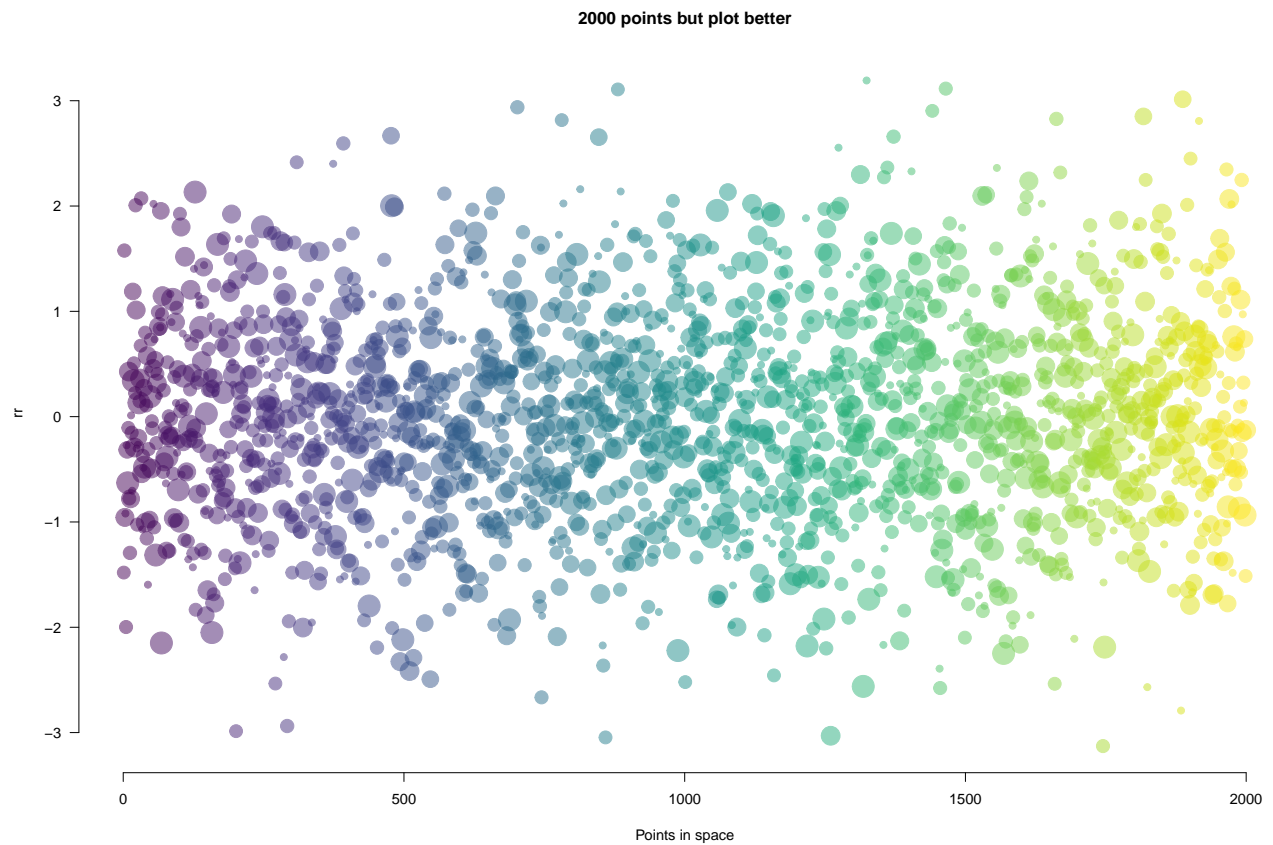


Figure 2. Example of a plot with improved graphics and its associated code embedded into a PDF from RMarkdown.

## 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 <sup>3</sup> )
$D$	host development	—
$RH$	energy in reproduction buffer	J



## Embed code from different languages

This is R code

```
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

```
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

```
<!-- links-->  
  <div class="footer">  
    <a href="dd_feed.html"  
      class="transition fade_in">  
      Latest post  
    </a>  
    &nbsp; &nbsp; &nbsp;  
    <a href="dd_contact.html"  
      class="transition fade_in">  
      Contact  
    </a>  
    &nbsp; &nbsp; &nbsp;  
    <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"     "sass"  
[41] "scss"
```

## All from R!

## References

Efthimiades, S., Physical meaning and derivation of Schrodinger and Dirac equations, Department of Natural Sciences, Fordham University. doi: [d34464566](https://doi.org/10.34464/566).

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.