

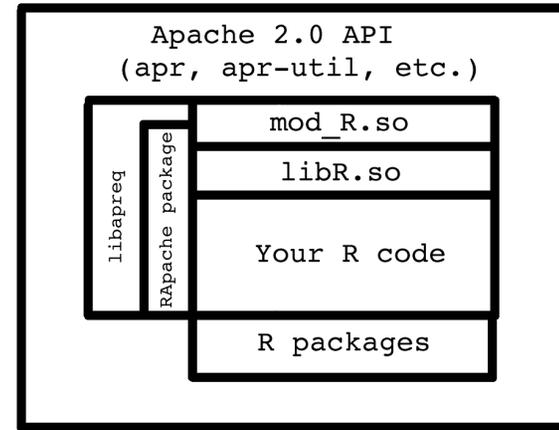
## Using R/Apache as the Statistical Engine for Web Applications

<http://biostat.mc.vanderbilt.edu/RApacheProject>

Jeffrey Horner

Vanderbilt University  
Department of Biostatistics

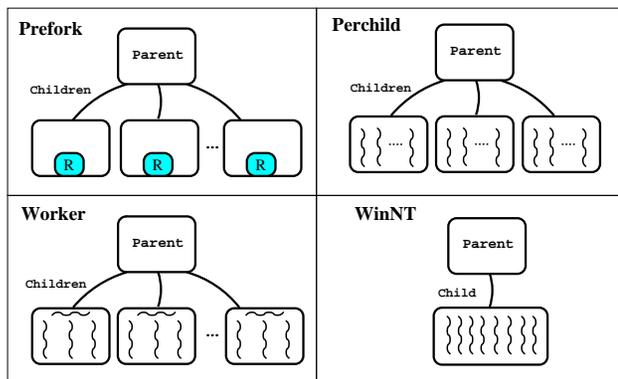
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## Apache 2.0 Multi-Processing Models



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## Hello World Example: <http://localhost/test/hello>

```

-----http.conf-----test.R-----
LoadModule R_module mod_R.so
<Location /test/hello>
  SetHandler r-handler
  Rsource /var/www/html/test.R
  RreqHandler handler
</Location>

handler <- function(r){
  apache.write(r,"<h1>Hello World!</h1>")
  OK
}
    
```



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## GDD/NRart Example

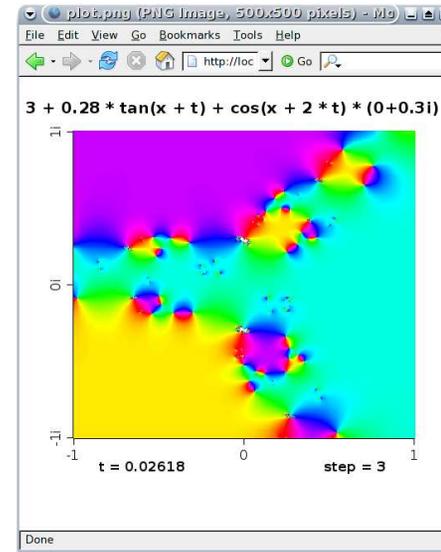
```
library('GDD')
library('NRart')
r2 <- function(r)
{
  apache.set_content_type(r,"image/png")

  GDD(ctx=apache.gdlib_ioctx(r),w=500,h=500,type="png")

  nr.image(x^3 + .28 * tan(x + t) + cos(x + 2*t)*.3i - 0.7,
           steps=3, points=400, col=rainbow(256), zlim=c(-pi, pi))

  dev.off()
  OK
}
```

## GDD/NRart Example Output



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## RApache Demonstrations

- ▶ Full Feature Test Handler
  - ▶ Demonstrates all the capabilities of RApache include CGI, manipulating HTTP headers, and file uploading.
- ▶ EVT-Web
  - ▶ Implements a web interface to a protein searching algorithm using Extreme Value Theory. The web interface takes a group of related proteins as input from the user and generates a profile via an external program (MEME). Then a model is built to predict which other proteins from a large database (MySQL) are also related to the group of proteins that the user specified.
- ▶ Polyart
  - ▶ Demonstrates the use of RApache as a web service to explore images created through the process of finding roots of functions, i.e. using the NRart package.

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## Ongoing Work

- ▶ Rmemcache
  - ▶ Implements client API to memcached, a possibly distributed cache (not a database) of small objects. R objects are stored in memcache server via serialize().
- ▶ udbMySQL
  - ▶ Uses the "User Defined Database" interface to store R objects of arbitrary size and structure in a MySQL table.
- ▶ Getting the next release out the door
  - ▶ Testing against Apache 2.2, R-2.3.1. Looking into getting rid of some of the apache.\* methods in favor of a more transparent interface, especially apache.write().

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