11 August 11th

11.1 Goals

1. Install LaTeX
2. Local CUBFits Installation
3. Preliminary Understanding of
    - Sella and Hirch paper - link biology and statistical mechanics concepts
    - GenomeGroup paper - fit the model knowing the expression levels
    - Wallace et al. paper? - MCMC stuff
    - Murray et al. paper? - framework

11.2 Progress/Notes

11.2.1 LaTeX installation

Began a LaTeX installation on Tremont, installed to the home directory. It should be usable on every computer.

I ran a full installation, which may have been a mistake. It took at least 7 hours, it was still installing when I left.

11.2.2 Local CUBFits Installation

I locally installed CUBFits, as well as the prerequisites (seqinr, VGAM, doSNOW, coda, EMCluster) to my home directory.

1. R
2. .libPaths"~/cubfitsLocal" #add local installation to library path
3. library(cubfits) #load the cubfits library
4. demo(roc.train, 'cubfits')

Doing so fixes the problem of "acceptance not in range", but introduces a new problem, "iterations terminated because half-step sizes are very small". It seems that cubfits-master is installed on Gauley, but cubfits 0.1 fixes some of those problems.

```
> .libPaths("~/cubfitsLocal/")
> .libPaths()
[1] "/home/lbrown/cubfitsLocal"     "/usr/local/lib/R/site-library"
[3] "/usr/lib/R/site-library"       "/usr/lib/R/library"
> find.package(cubfits)
Error in find.package(cubfits) : object 'cubfits' not found
```

```
> find.package("cubfits")
[1] "/home/lbrown/cubfitsLocal/cubfits"
> library(cubfits)
> demo(roc.train, 'cubfits')


        demo(roc.train)
        ---- ~~~~~~~~~

> start.time <- proc.time()

> suppressMessages(library(cubfits, quietly = TRUE))

> set.seed(1234)

> .CF.AC$renew.iter <- 3

> # .CF.CT$type.p <- "lognormal_bias"
> # .CF.CONF$scale.phi.Obs <- FALSE
> # .CF.CONF$estimate.bias.Phi <- TRUE
>  ex.train$phi.Obs <- ex.train$phi.Obs / mean(ex.train$phi.Obs)

> ret.time <- system.time({
+   ret <- cubfits(ex.train$reu13.df, ex.train$phi.Obs, ex.train$y, ex.train$n,
+                  nIter = 20,
+                  verbose = TRUE, report = 5,
+                  model = "roc", adaptive = "simple")
+ })
pid:             56149
start:           Tue Aug 12 13:29:00 2014
iter: 5          Tue Aug 12 13:29:00 2014
iter: 10         Tue Aug 12 13:29:00 2014
iter: 15         Tue Aug 12 13:29:00 2014
iter: 20         Tue Aug 12 13:29:00 2014
iter: 25         Tue Aug 12 13:29:00 2014
iter: 30         Tue Aug 12 13:29:00 2014
iter: 35         Tue Aug 12 13:29:00 2014
iter: 40         Tue Aug 12 13:29:00 2014
iter: 45         Tue Aug 12 13:29:00 2014
iter: 50         Tue Aug 12 13:29:00 2014
iter: 55         Tue Aug 12 13:29:00 2014
iter: 60         Tue Aug 12 13:29:00 2014
iter: 65         Tue Aug 12 13:29:00 2014
```

```
iter: 70         Tue Aug 12 13:29:00 2014
iter: 75         Tue Aug 12 13:29:00 2014
iter: 80         Tue Aug 12 13:29:00 2014
iter: 85         Tue Aug 12 13:29:00 2014
iter: 90         Tue Aug 12 13:29:00 2014
iter: 95         Tue Aug 12 13:29:00 2014
iter: 100        Tue Aug 12 13:29:00 2014
           user.self sys.self elapsed user.child sys.child
total.time   0.29200    8e-03 0.29900          0         0
avg.time     0.00292    8e-05 0.00299          0         0
iter: 105        Tue Aug 12 13:29:00 2014
iter: 110        Tue Aug 12 13:29:00 2014
iter: 115        Tue Aug 12 13:29:00 2014
iter: 120        Tue Aug 12 13:29:00 2014

> print(ret.time)
   user  system elapsed
  0.816   0.028   0.935

> x <- rowMeans(do.call("cbind", ret$phi.Mat)[, 11:20])

> y <- ex.train$phi.Obs

> x <- log10(x / mean(x))

> y <- log10(y / mean(y))

> print(mean(x))
[1] -0.4369554

> print(summary(lm(y ~ x))$r.squared)
[1] 0.8932789

> # warning: iterations terminated because half-step sizes are very small
>
> print(proc.time() - start.time)
   user  system elapsed
  0.864   0.028   0.986
```

11.2.3 Readings

First read of the Stella and Hirch paper. It helped develop my intuitions regarding CUB-Fits/SEMPRR, though it seems to be only tangentially related. It's good for drawing these connections, which will help with understanding and analyzing the code (indirectly)

11.3 Future Goals

1. Test LaTeX installation
2. Continue Readings
3. Continue analysing Gauley errors?