

Robert Smith

Lab 3: Pthreads & Floyd's Algorithm

October 15, 2013

To begin my familiarity with Floyd's Algorithm, I investigated the serial implementation of the algorithm and confirmed its effectiveness as a means to compare the parallel version.

Upon the investigation of the whole of the data, and an ANOVA experiment, it seems that there is a significant difference in the amount of time that it takes for Floyd's Algorithm to evaluate a 28x28 matrix and the number of threads involved in the experiment. Based on further analysis with Tukey's HSD test it seems that there is no significant difference between 4 and 2 threads on my machine (Intel Core i5 laptop 1.7 ghz), but there is a significant difference between 2 & 7 threads and 4 & 7 threads.

Based on this, and the knowledge that my laptop is dual-core with hyperthreading which allows a maximum of 4 simultaneous threads I'd follow this up with an experiment to confirm that the maximum amount of simultaneous threads allow for the fastest execution of a pthreads program on a given machine.

```
## Call:
##   aov(formula = time ~ threads, data = P3)
##
## Terms:
##               threads Residuals
## Sum of Squares 6.793e+08 2.247e+09
## Deg. of Freedom      2         72
##
## Residual standard error: 5586
## Estimated effects may be unbalanced

##   Tukey multiple comparisons of means
##     95% family-wise confidence level
##
## Fit: aov(formula = time ~ threads, data = P3)
##
## $threads
```

```
##      diff   lwr   upr  p adj
## 4-2  621.1 -3160  4402 0.9185
## 7-2 6671.9  2891 10453 0.0002
## 7-4 6050.8  2270  9832 0.0008
```

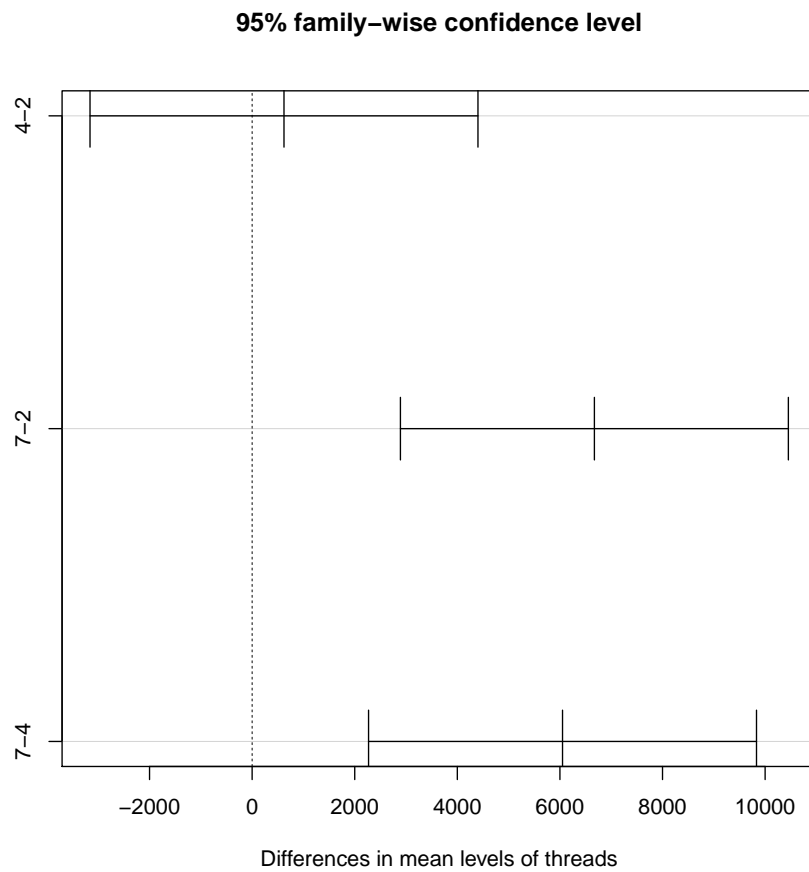


Figure 1: plot of chunk data2

```
## NULL
```

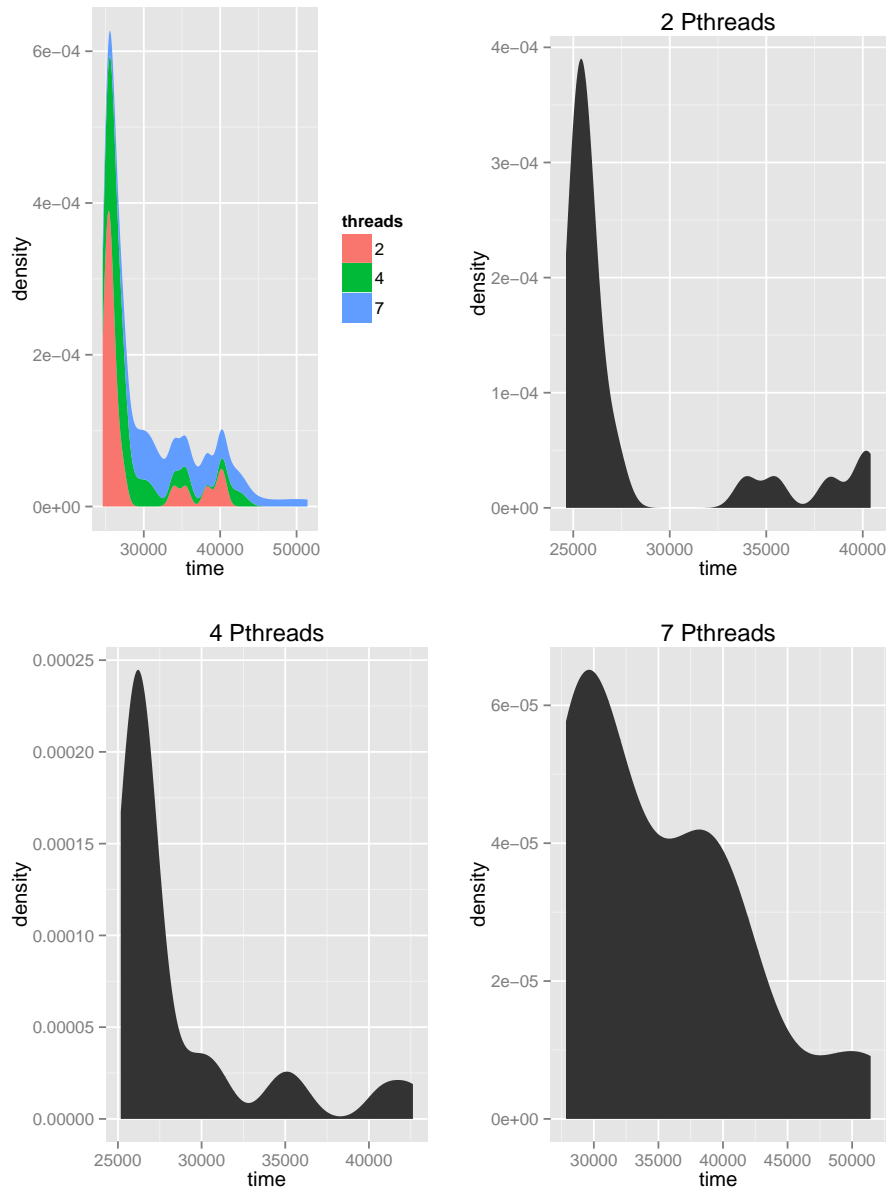


Figure 2: plot of chunk data3