

detrendr examples

Some examples of baseline fitting with detrendr

Compare cholesky decompositions and solvers

```
nSeq <- seq(500, 20000, 500)
k <- 4

timing <- data.frame(n=nSeq, Matrix_chol = NA, Matrix_solve = NA,
                    Eigen_chol = NA, chol_solve = NA)

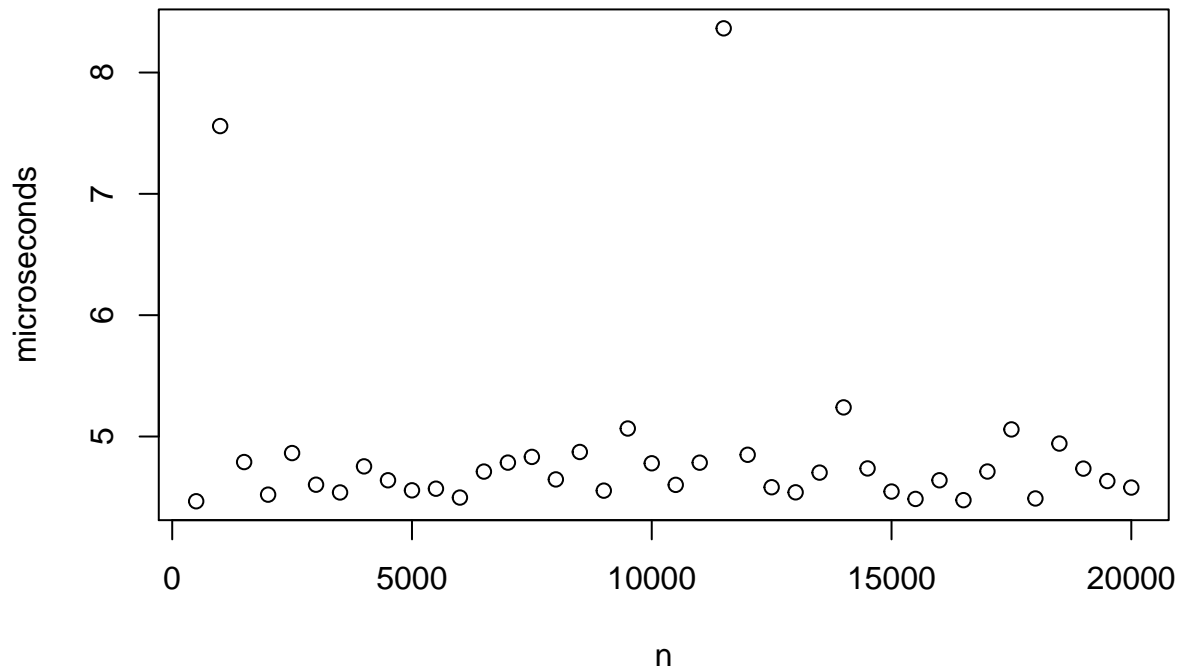
i <- 1
for (n in nSeq){
  D <- get_Dk(n, k)
  M <- as(Diagonal(n) + Matrix::crossprod(D), "dgCMatrix")
  theta <- rnorm(n)

  timing$Matrix_chol[i] <- median(microbenchmark(cholM <- chol(M))$time*1e-3)
  timing$Eigen_chol[i] <- median(microbenchmark(cholM2 <- chol_eigen(M))$time*1e-3)
  timing$Matrix_solve[i] <- median(microbenchmark(
    x1 <- as.numeric(Matrix::solve(cholM, Matrix::solve(t(cholM), theta))))$time*1e-3)
  timing$chol_solve[i] <- median(microbenchmark(
    x2 <- chol_solve(cholM, chol_solve(t(cholM), theta, k, FALSE),
                     k, TRUE))$time*1e-3)

  i <- i+1
}

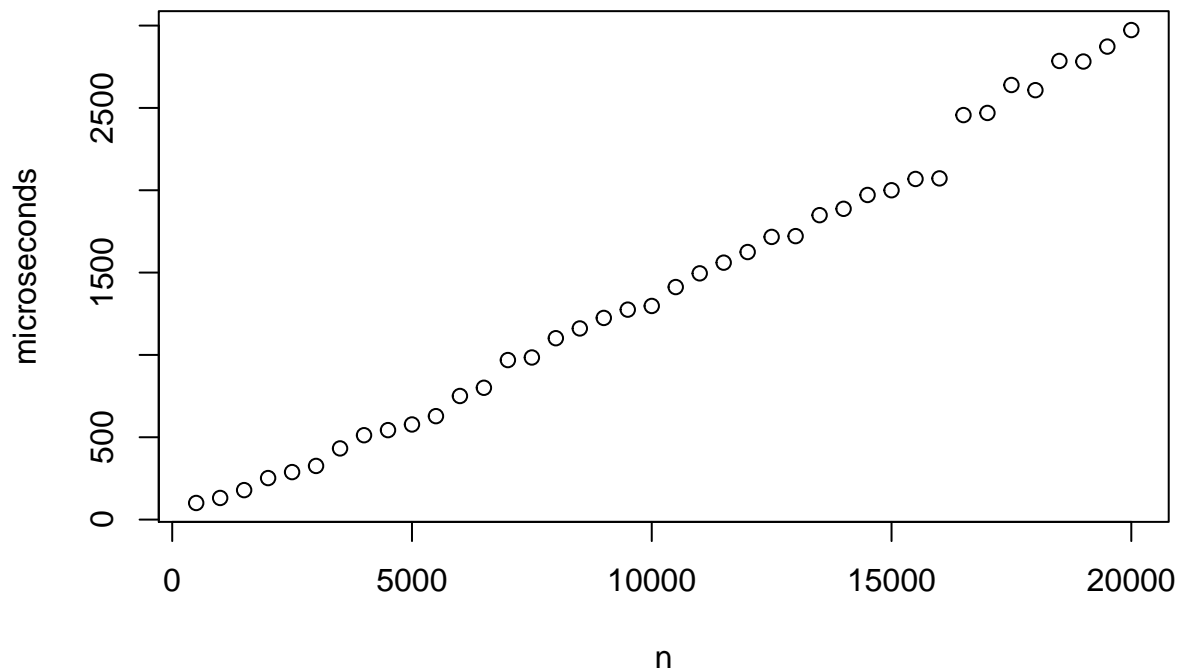
plot(Matrix_chol~n, timing, ylab="microseconds",
     main="Matrix package sparse cholesky decomposition")
```

Matrix package sparse cholesky decomposition



```
plot(chol_solve~n, timing, ylab = "microseconds",  
     main="RcppEigen sparse cholesky decomposition")
```

RcppEigen sparse cholesky decomposition



```
plot(chol_solve~n, timing, ylab = "microseconds",  
     main="My banded cholesky solver (black) vs. Matrix solver (blue)")  
points(Matrix_solve~n, timing, col="blue")
```

My banded cholesky solver (black) vs. Matrix solver (blue)

