RAM_SR_analysis

Hao Ye

17 November, 2015

Contents

Setup

Load in the packages we need and the analysis functions.

```r
library(rEDM)
library(parallel)
library(quantreg)

source("my_functions.R")
knitr::opts_chunk$set(fig.height = 6)
```

Pre-processing

Read the data and documentation from the RAM database website.

```r
extract_data() # pull data from RAM website
process_data() # process SR data
summarize_data()
```

Check overlap between web files and zip file from Steve.

```r
get_doc_info()
load("stock_ids.Rdata")
both <- intersect(andi_stock_ids, web_stock_ids)
a_not_w <- setdiff(andi_stock_ids, web_stock_ids)
w_not_a <- setdiff(web_stock_ids, andi_stock_ids)
```

Analysis

Do univariate analysis. For each stock, do simplex and s-map, find whether AR-0 or AR-1 fits better using AICc, compute simplex and s-map for 1000 AR surrogates.

```
run_univariate_analysis()
append_univariate_analysis()
```

```r
load("sr_results.Rdata")

results <- do.call(rbind, lapply(sr_results, function(x) {
    if(class(x) == "try-error")
        return(NA)

    # pull out EDM performance
    simplex_temp <- x$simplex_out[x$simplex_out$tp == 1,]
    smap_temp <- x$smap_out[x$smap_out$tp == 1,]
    n <- sum(is.finite(x$rec))
    best_E <- x$best_E
    simplex_rho <- simplex_temp$rho[simplex_temp$E == best_E]
    simplex_mae <- simplex_temp$mae[simplex_temp$E == best_E]
    smap_rho <- max(smap_temp$rho)
    smap_mae <- min(smap_temp$mae)

    # compute AR performance
    if(x$ar_0$aicc < x$ar_1$aicc)
    {
        ar_pred <- x$rec - x$ar_0$residuals
    } else {
        ar_pred <- x$rec - x$ar_1$residuals
    }
    ar_rho <- cor(x$rec, ar_pred, use = "pairwise")
    ar_mae <- mean(abs(x$rec - ar_pred), na.rm = TRUE)

    # compute EDM p-values
    simplex_rho_p <- (sum(simplex_rho < x$simplex_null$rho)+1) / (NROW(x$simplex_null) + 1)
    smap_rho_p <- (sum(smap_rho < x$smap_null$rho)+1) / (NROW(x$smap_null) + 1)
    simplex_mae_p <- (sum(simplex_mae > x$simplex_null$mae)+1) / (NROW(x$simplex_null) + 1)
    smap_mae_p <- (sum(smap_mae > x$smap_null$mae)+1) / (NROW(x$smap_null) + 1)

    return(data.frame(n = n,
                      simplex_rho = simplex_rho,
                      simplex_mae = simplex_mae,
                      smap_rho = smap_rho,
                      smap_mae = smap_mae,
                      ar_rho = ar_rho,
                      ar_mae = ar_mae,
                      simplex_rho_p = simplex_rho_p,
                      smap_rho_p = smap_rho_p))
}))
```

Plots (part 3)

2−step ahead forecasts

3−step ahead forecasts

4−step ahead forecasts