

## Homework 2

Due October 21, 2015

Please submit your homework by email to haksun [dot] li {at} numericalmethod -dot- com.

Q1.

Hand calculate the Viterbi path for the example discussed in class.

Q2.

Code up the Viterbi algorithm in SuanShu for RabinerHiddenMarkovModel. Make sure you do the computations in the log space. Compare your answer in Q1 to the output of your program.

Q3.

Using real data (liquid stocks, indices), construct a strategy (not necessary SMA) using Rabiner HMM and RabinerTrainByEM. Consider a two state model (UP and DOWN) with 3 discrete sets of observations (+, 0, -). + means big positive returns; 0 means small positive or negative returns; - means big negative returns. What is the innovation in your trading strategy?

Make sure you include transaction costs, e.g., 0.5%.

Write a nice report.

Q4.

Fit the KST to real data using MixtureGammaDistribution. Run your own variant of SMA to create a trading strategy. What is the innovation in your trading strategy? E.g., trade only when the fit is good, model selection by AIC, BIC.

Make sure you include transaction costs, e.g., 0.5%.

Write a nice report.

How does this version compared to that in Q3?