

Dekalog Blog

"Trading is statistics and time series analysis." This blog details my progress in developing a systematic trading system for use on the futures and forex markets, with discussion of the various indicators and other inputs used in the creation of the system. Also discussed are some of the issues/problems encountered during this development process. Within the blog posts there are links to other web pages that are/have been useful to me.

[Home](#) [My Trading Library](#) [Future Ideas to test, things to do](#)

Monday, 11 December 2017

Time Warp Edit Distance

Part of my normal routine is to indulge in online research for use useful ideas, and I recently came across [An Empirical Evaluation of Similarity Measures for Time Series Classification](#), and one standout from this paper is the [Time Warp Edit Distance](#) where, from the conclusion, *"...the TWED measure originally proposed by Marteau (2009) seems to consistently outperform all the considered distances..."*

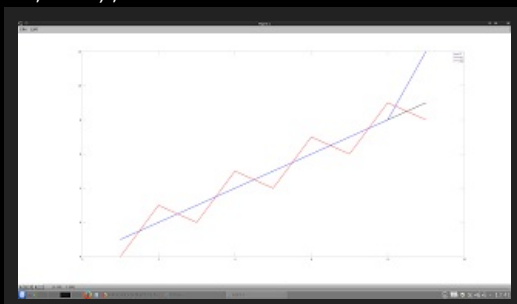
Below is my [Octave](#) .oct function version of the above linked MATLAB code.

```
#include octave oct.h
#include octave dmatrix.h
#include limits> // for infinity
#include math.h // for sqrt

DEFUN_DLD ( twed, args, nargout,
  "-*- texinfo -*--\n\
  @deftypefn {Function File} {} twed (@var{A , timeSA , B , timeSB , lamb"
  ...
```

As a quick test I took the example problem from [this Cross Validated thread](#), the applicability I hope being quite obvious to readers:

```
A = [1, 2, 3, 4, 5, 6, 7, 8, 9] ;
B1 = [1, 2, 3, 4, 5, 6, 7, 8, 12] ;
distance1 = twed( A , 1:9 , B1 , 1:9 , 1 , 0.001 )
distance1 = 3
B2 = [0, 3, 2, 5, 4, 7, 6, 9, 8] ;
distance2 = twed( A , 1:9 , B2 , 1:9 , 1 , 0.001 )
distance2 = 17
graphics_toolkit('fltk') ;
plot(A,'k','linewidth',2,B1,'b','linewidth',2,B2,'r','linewidth',2);
legend( "A" , "B1" , "B2" );
```



It can be seen that the twed algorithm correctly picks out B1 as being more like A than B2 (a lower twed distance, with default values for lambda and nu of 1 and 0.001 respectively, taken from the above survey paper) when compared with the simple squared error metric, which gives identical results for both B1 and B2.

More on this in due course.

Posted by Dekalog at [13:56](#)

Labels: [Market Classifier](#), [Octave](#)

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