MyDTW – Dynamic Time Warping program for stratigraphical time series

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One of the general tasks in many geological disciplines is matching of one time or space signal to another. It can be classical correlation between two cores or cross-sections in sedimentology or marine geology. For example, tuning a paleoclimatic signal to a target curve, driven by variations in the astronomical parameters, is a powerful technique to construct accurate time scales. However, these methods can be rather time-consuming and can take ours of routine work even with the help of special semi-automatic software. Therefore, different approaches to automate the processes have been developed during last decades. Some of them are based on classical statistical cross-correlations such as the 'Correlator' after Olea [1]. Another ones use modern ideas of dynamic programming. A good example is as an algorithm developed by Lisiecki and Lisiecki [2] or dynamic time warping based algorithm after Pälike [3].

We introduce here an algorithm and computer program, which are also stemmed from the Dynamic Time Warping algorithm class. Unlike the algorithm of Lisiecki and Lisiecki, MyDTW does not lean on a set of penalties to follow geological logics, but on a special internal structure and specific constrains. It differs also from [3] in basic ideas of implementation and constrains design. The algorithm is implemented as a computer program with a graphical user interface using Free Pascal and Lazarus IDE and available for Windows, Mac OS, and Linux. Examples with synthetic and real data are demonstrated. Program is available for free download at http://www.marum.de/Sergey_Kotov.html .

References:
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