World Academy of Science, Engineering and Technology
International Journal of Computer and Information Engineering
Vol:16, No:04, 2022

Algorithms for Fast Computation of Pan Matrix Profiles of Time Series Under Unnormalized Euclidean Distances

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Abstract : We propose an approximation algorithm called LINKUMP to compute the Pan Matrix Profile (PMP) under the unnormalized l_∞ distance (useful for value-based similarity search) using double-ended queue and linear interpolation. The algorithm has comparable time/space complexities as the state-of-the-art algorithm for typical PMP computation under the normalized l_2 distance (useful for shape-based similarity search). We validate its efficiency and effectiveness through extensive numerical experiments and a real-world anomaly detection application.

Keywords : pan matrix profile, unnormalized euclidean distance, double-ended queue, discord discovery, anomaly detection
Conference Title : ICASDA 2022 : International Conference on Applied Statistics and Data Analytics
Conference Location : Boston, United States
Conference Dates : April 21-22, 2022