

**Title:** DTW Tree: A Hybrid of Dynamic Time Warping and AVL Tree Algorithm for Optimal Match between Multiple Temporal Sequences

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## **ABSTRACT**

Temporal Sequences are very popular input data in providing the program to analyze the sequence of actions happening in a space of time. This sequence exists in speech, heart rate, earthquake waves, human movements, radio waves, sounds or any data that happen in space of time. One of the most popular algorithms used to analyze temporal sequence is the Dynamic Time Warping or DTW. DTW is used in finding the best alignment between 2 given temporal sequences only. It is an efficient algorithm but like all algorithms it has some downfalls. This algorithm has a difficulty analyzing multiple temporal sequences. The researchers made an experimental research to solve this issue and came up with new hybrid algorithm namely DTW Tree, a hybrid of DTW and AVL Tree algorithm. With the completion of this study, the application of DTW Tree opens new opportunities and innovation in the world of algorithms.

**Keywords:** Hybrid Algorithm, Dynamic Time Warping, AVL Tree Data Structure, Hand Motion Recognition, Optimal Match, and Temporal Sequences