

# Kajian komputasi paralel pada algoritma tree based of consistency objective function for evaluation alignment (T-coffee) dalam masalah multiple sequence alignment = A study parallel on computation of tree based of consistency objective function for evaluation alignment (T-coffee ) in multiple sequence alignment problems

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## Abstrak

Tree Based Of Consistency Objective Function For Evaluation Alignment (T-COFFEE) merupakan algoritma untuk menyelesaikan permasalahan multiple sequence alignment (MSA). Algoritma ini menggabungkan dua teknik, pertama Tree Based yang merupakan Progressive Alignment dan kedua Consistency Objective Function berupa extending library. Pada pembahasan skripsi ini akan digunakan data sequence dari database ensembl yang terdiri dari database DNA atau protein yang akan diproses dengan global alignment (Needleman-Wunsch) dan local alignment (Smith- Waterman) dengan harapan informasi yang dihasilkan pada akhir penyejajaran akan menggambarkan hasil penyejajaran yang optimal. Proses pembentukan primary dan extended library pada T-COFFEE membutuhkan waktu lama sehingga untuk mempercepat waktu proses T-COFFEE digunakan teknik komputasi paralel Graphic Processing Unit (GPU). Skripsi ini akan menjelaskan algoritma T-COFFEE, algoritma paralel T-COFFEE, serta mengukur efisiensi dari kedua algoritma tersebut.

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Tree Based Of Consistency Objective Function For Evaluation Alignment (T-COFFEE) is an algorithm to solve the problem of multiple sequence alignment (MSA). This algorithm combines two techniques, first is Tree-Based with Progressive Alignment and second is Consistency of Objective Function by extending library. In this skripsi, we use the data from the ensembl database that consisting of DNA or protein data. Those data will be processed by the global alignment (Needleman-Wunsch) and local alignment (Smith-Waterman) that is expected to give optimal alignment result at the end of the alignment process. The generating of Primary and Extended Library is the most time consuming, hence to speed up the T-COFFEE process, a parallel version of T-COFFEE algorithm is needed by implementing parallel computing on Graphic Processing Unit (GPU). In this skripsi, the T-COFFEE algorithm, the parallel T-COFFEE algorithm, and the measurement of their speed up and efficiency will be discuss.