

INTISARI

Optimasi Penjadwalan Ujian Tugas Akhir Menggunakan Algoritma Genetika dengan Teknik *Tournament Selection* dan *Violated Directed Mutation* (VDM)

Oleh:

Dian Meliani Kusuma Dewi

22/508695/PPA/06443

Penjadwalan ujian Tugas Akhir adalah proses kompleks yang sering menghadapi kendala seperti tumpang tindih jadwal, keterbatasan dosen penguji, dan waktu eksekusi yang lama. Untuk mengatasi masalah ini, penelitian ini mengusulkan optimasi Algoritma Genetika (GA) dengan kombinasi *Tournament Selection* pada tahap seleksi individu dan *Violated Directed Mutation* (VDM) pada tahap mutasi.

Tahapan penelitian meliputi pengumpulan data mahasiswa dan dosen penguji berdasarkan kecocokan lab keilmuan, implementasi GA dengan operator yang diusulkan, serta evaluasi berdasarkan nilai *fitness* dan waktu eksekusi.

Hasil eksperimen menunjukkan bahwa GA dengan *Violated Directed Mutation* dan *Tournament Selection* memiliki rasio nilai *fitness* berbanding waktu eksekusi terbaik dibandingkan dengan metode GA lainnya yang digunakan dalam perbandingan. Selain itu, penelitian ini mengidentifikasi kombinasi operator GA dan parameter GA terbaik yang menghasilkan jadwal dengan minimal tumpang tindih jadwal dan efisiensi tinggi. Pendekatan ini diharapkan dapat menjadi solusi optimal penjadwalan ujian Tugas Akhir yang lebih efektif dan efisien.

Kata Kunci: Algoritma Genetika, Penjadwalan Tugas Akhir, *Tournament Selection*, *Violated Directed Mutation*, Optimasi Penjadwalan

ABSTRACT

Optimization of Final Project Exam Scheduling Using Genetic Algorithm with *Tournament Selection* and *Violated Directed Mutation* (VDM)

by:

Dian Meliani Kusuma Dewi
22/508695/PPA/06443

Final Thesis Exam Scheduling is a complex process that often faces challenges such as schedule conflicts, limited availability of examiners, and long execution times. To address these issues, this study proposes the optimization of the Genetic Algorithm (GA) by combining *Tournament Selection* for individual selection and *Violated Directed Mutation* (VDM) for *mutation*.

The research stages include collecting data on students and examiners based on the compatibility of their research fields, implementing GA with the proposed operators, and evaluating performance based on *fitness* values and execution time.

Experimental results show that GA with *Violated Directed Mutation* and *Tournament Selection* achieves the best *fitness*-to-execution time ratio compared to other GA methods used in the comparison. Additionally, this study identifies the best combination of GA operators and parameters, resulting in schedules with minimal conflicts and high efficiency. This approach is expected to serve as an optimal solution for a more effective and efficient final thesis exam scheduling system.

Keyword: Final Thesis Exam Scheduling, Genetic Algorithm, *Tournament Selection*, *Violated Directed Mutation*, Scheduling Optimization