

***Optimization of Scheduling in the Robotku Probolinggo Robotics Course
Information System Using a Genetic Algorithm Method***

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ABSTRACT

The scheduling process at Robotku Probolinggo is still conducted manually, which may lead to conflicts involving teachers, classrooms, and classes, as well as mismatches in teacher availability and qualifications. This study aims to design and implement a robotics course scheduling information system using a Genetic Algorithm (GA) to generate schedules according to the applied constraints. Testing was conducted using the black-box method and Genetic Algorithm testing through several parameter combinations and 10 executions. The black-box testing results showed a 100% conformity rate across 9 scenarios tested by 5 testers. The best parameters obtained were a population size of 30, crossover probability (P_c) of 0.5, mutation probability (P_m) of 0.1, and a maximum of 100 generations. The Genetic Algorithm testing achieved a 70% success rate in obtaining optimal solutions without conflicts, with an average fitness value of 0.833333. The implementation of early stopping resulted in an average stopping point at generation 76.3, with an average execution time of 0.2567 seconds. These results indicate that the Genetic Algorithm can be applied to assist the automatic scheduling process for robotics courses at Robotku Probolinggo and produce optimal scheduling solutions.

Keywords : Genetic Algorithm, Scheduling, Information System, Robotics Course