

Judul Tesis: Timetable Scheduling Menggunakan Particle Swarm Optimization

ABSTRACT

Lecturer timetable scheduling is an important part in the resource allocation planning. Due to the large amount of transactions and various related constraints have to be taken into account in timetable scheduling process, resource manager team shall need a lot of time to the solve the problem.

This research is aimed to discuss the application of Particle Swarm Optimization (PSO) that can be used to automatically generate optimal lecturer timetable scheduling. Using Software Laboratory Center (SLC) data, some hard constraints are taken into account such as the assistant should teach according to their qualifications, teaching in their workshift and doesn't teach any course that are being taken. Some soft constraints are also considered and the associated cost function is built based on these hard and soft constraints.

Based on the computational results, the amount of penalty obtained by the PSO is much smaller than the GA on 500th iteration. The calculation is performed by comparing the amount of penalty that earned each time a hard constraint or soft constraint is violated by the implementation of PSO or GA to the total penalty obtained when all constraints are violated.

Keywords: *Particle Swarm Optimization, hard constraints, soft constraints, Timetable Scheduling*

ABSTRAK

Lecturer timetable scheduling atau penjadwalan dosen atau asisten merupakan bagian terpenting dalam perencanaan alokasi sumber daya. Besarnya transaksi dan banyaknya constraints dalam proses timetable scheduling menyebabkan tim resource manager memerlukan banyak waktu untuk menyelesaikan permasalahan ini.

Penelitian ini kemudian ditujukan untuk membahas penerapan metode Particle Swarm Optimization (PSO) yang dapat digunakan untuk menghasilkan lecturer timetable scheduling dengan optimal secara otomatis. Dengan menggunakan data Software Laboratory Center (SLC), beberapa hard constraints yang diperhitungkan adalah asisten harus mengajar matakuliah sesuai kualifikasinya, mengajar dalam shift kerjanya dan tidak mengajar matakuliah yang diambalnya. Kemudian beberapa soft constraints juga diperhitungkan dan cost function yang berhubungan dibangun berdasarkan hard dan soft constraints tersebut.

Berdasarkan hasil percobaan, jumlah penalty yang didapatkan oleh metode PSO jauh lebih kecil dari pada metode GA pada iterasi ke 500. Perhitungan ini dilakukan dengan membandingkan jumlah penalty yang didapat pada saat hard constraints atau soft constraint dilanggar oleh implementasi PSO atau GA dengan jumlah total penalty yang didapatkan ketika semua constraints dilanggar.

Kata Kunci: *Particle Swarm Optimization, hard constraints, soft constraints, penjadwalan*