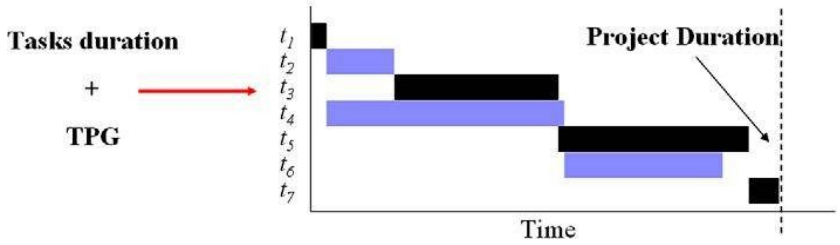
IT Services

# Case Study

**BlueBEAR** provides a substantial computing resource that properly supports the research work of research staff and students at Birmingham. It provides a cost effective facility that optimises the effectiveness of research and ensures the University continues to be a world-class academic learning and research environment.

## Meta-heuristic techniques to solve the Software Project Management Problem




### Challenge

Nowadays, with the popularity of software systems, businesses are unable to work without the support of software. Software project management is a special type of project management for developing software, which includes budget control, people assignment and so on. Thus, software project management becomes more and more important in information technology industry. However, it is very difficult to manage a software project successfully. A good software project requires reasonable arrangement of employees, budget control and resources due to objective and subjective constraints. If the management of software project is not proper, it may cause over budget or postpone delivery time, which results in inestimable effect. It is a challenging task to develop high-quality products of software within budget. One of the critical issues in the practice of software engineering is project scheduling problem, which consists in deciding who does what during the software lifetime. However, many scheduling problems are NP-hard, and very complex combinatorial optimization problems. If the process of scheduling only depends on project manager's manual work, it is hard to promise an optimal scheduling in a reasonable time. Therefore, Assisted by experts in optimization, businesses applies automated project scheduling tools to reduce their the practice of software engineering is project-scheduling problem, which consists in deciding who does what during the software project lifetime.

### Background

The main idea behind this project is to apply to use a three different genetic algorithms to deal with software project management project (SPMP), which no paper has done before. As well as comparing the performance of those algorithms with the previous approach based on GAs. Particle Swarm Optimization is a swarm-based algorithm with communication between individuals. CHC is a pure genetic algorithm which uses HUX as a mutation operator. While CMA-ES is a mathematical algorithm who deals with matrix. To most efficiently find good solutions to SPMP, it is necessary to compare different search heuristics. Also, there has been little previous work on comparing different search heuristics for the SPMP problem. It is therefore possible that the GA-based approach is far from the most efficient for this particular problem.

### Results

I will compare the different heuristics with the jobs that have been done already in this field, in order to determine which approach is better. So I will look at the fitness function, time average of the solution and number of feasible solutions between the total amount of them.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