Computational Optimisation

Syllabus Information

CS 3490 - Computational Optimisation

Associated Term: 2023/24 Academic Session
Learning Objectives:

To introduce the basic models of computational optimisation and the basic algorithms for solving computational optimisation problems. To demonstrate the theoretical and computational methods of analysing computational optimisation algorithms and will discuss available software packages for solving problems. Introduction: algorithm efficiency and problem complexity Linear programming (LP): LP model, formulating problems as LP problems, graphical solution, simplex method, duality in LP;, decomposition of LP problems, LP software Integer Programming (IP): IP models, branch-and-bound algorithm Computational optimisation problems: greedy-type algorithms, construction heuristics and local search for the TSP Heuristics: DMERN problem and signed graphs; heuristics for DMERN, experimental analysis of embedded network and TSP heuristics, theoretical analysis of heuristics, meta-heuristics Learning Outcomes: demonstrate an understanding of the basic models of computational optimisation apply the basic algorithms for solving computational optimisation problems evaluate theoretical and computational methods of analysing computational optimisation algorithms use enhanced algorithmic and mathematical skills

Required Materials: [Click here for the reading list system](#)
Technical Requirements: The total number of notional learning hours associated with the course are 150. **These will normally be broken down as follows:** 30 hour(s) of Lecture(s) across 10 week(s) 120 hours of Guided Independent Study **Formative Assessment:** Completion of quizzes embedded in asynchronous materials - Feedback through course completion block on moodle **Summative Assessment:** Worksheets, normally between 1 and 3 (Guideline time for completion - 10 hours) - 10% Examination (120 Minutes) - 90%