USF
UNIVERSITY OF
SOUTH FLORIDA

Dr. Amir Salehipour, ARC DECRA Fellow
University of Technology Sydney, Australia

Tuesday, October 31st, 2017, 3:00 p.m. - 4:00 p.m.
College of Engineering (ENB) Room 109

A Decomposition Method for Solving Scheduling Problems

Abstract

This talk will discuss a decomposition method for solving difficult scheduling problems that involve both sequencing and scheduling. One example of such problems is $1|rj , sjk| P(wjEj + w 0 jTj)$. Besides the theoretical interests in solving these problems, they have been used to model many real-world problems. Two examples include the Aircraft Landing Problem (ALP), and the Just-In-Time Job Shop Scheduling (JIT-JSS) Problem. We decompose this class of problems into two problems of sequencing and scheduling. While obtaining an optimal sequence in a reasonable amount of time is very difficult, obtaining an optimal schedule provided that a sequence is given can be performed in polynomial time. Therefore, we heuristically obtain a sequence, and then we optimally schedule the sequence by using available mixed-integer programming solvers. The heuristic algorithm that obtains a sequence utilizes several neighborhood structures including an innovative relaxation neighborhood, which we developed for these problems. We report our attempts to solve two problems of ALP and JIT-JSS by the proposed method. We demonstrate that our proposed method competes well against all available solution methods of the ALP and JIT-JSS. In particular, we report new best known solutions for over 69% of the JIT-JSS instances in a short time.

Biography

Dr Amir Salehipour is the Australian Research Council (ARC) Discovery Early Career Researcher Award (DECRA) Fellow at the University of Technology Sydney (UTS). His research interests include developing innovative mathematical models and optimization techniques for modeling, solving and analyzing complex real-world optimization problems in a variety of domains, from scheduling and manufacturing, to transportation, routing and supply chain logistics, and to healthcare systems among others.