Canadian Operational Research Society

Calgary Section

http://www.corscalgary.org/

PROFESSIONAL DEVELOPMENT SEMINAR

When: Noon to 1:30 PM, Wednesday, Nov. 18th, 2009

Room 217

TransCanada Tower

450 - 1 Street SW

(See attached map)

SPEAKER

Anubhuti Parajuli.

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University of Calgary

TOPIC

Scheduling to optimize due date performance under uncertainty of processing times

Abstract:

In recent years, researches on job scheduling have focused on investigating the scheduling problem under probabilistic nature of the processing times. This research investigates the optimal sequencing of jobs at one and two workstations when processing times are unknown but their distributions are known. A comparative evaluation of the stochastic scheduling approach to the deterministic approach is done with several performance objectives. Extensions to previous works include the consideration of earliness in the objective function and the use of inserted or forced, idle time as a decision variable. Further, the research focuses on a static problem. In other words, there were no new job arrivals after the creation of a schedule.

Deterministic scheduling is performed using Evolutionary Solver® included in the Premium Solver add-in for Excel, to find the best decision variable settings, these being the sequence and idle times. All user inputs related to the set of jobs to be scheduled, such as processing time distributions and due dates, were defined in an Excel® worksheet. Stochastic scheduling is performed similarly except that many problem instances are first simulated and the decision variables are based on the expected performance.

The results demonstrate that the stochastic scheduling can result in different sequences than deterministic scheduling. These results, using processing times generated from continuous probability distributions, are consistent with prior research using discrete probability distributions. More importantly, the research has extended the study of stochastic versus deterministic scheduling by considering inserted idle time decisions, along with relevant alternative performance measures.

Keywords: Sequencing, Scheduling, Optimal Schedule, Inserted Idle Time, Evolutionary Solver

About the Speaker:

Anubhuti Parajuli is currently a Msc student in the Department of Mechanical and Manufacturing Engineering at the University of Calgary, Canada. He is doing his research in a relatively new field of schedule optimization under stochastic (uncertain) conditions under the supervision of Dr. S.T. Enns and Dr. Diane P Bischak. He holds a prior Masters degree in Mechanical Engineering from the Delft University of Technology, Delft (Netherlands). He is interested in the areas of management sciences, particularly those involving mathematical models to decision problems in manufacturing industries.

There is no charge for attending the meeting. The room is available until 1:30 PM for those interested in staying afterwards to mingle and meet other OR practitioners.

Sketch of Location for CORS Meetings at TransCanada Tower in Conference Rooms 214 and 217.