

Canadian Operational Research Society Calgary Section <u>http://www.corscalgary.org/</u>

PROFESSIONAL DEVELOPMENT SEMINAR

When: Noon to 1:30 PM, Thursday, Feb. 18th, 2010

Room 217 TransCanada Tower 450 - 1 Street SW (See attached map)

SPEAKER

Ahmed Al-Emran PhD Student, Schulich School of Engineering University of Calgary

TOPIC

Studying the Impact of Uncertainty in Operational Release Planning – An Integrated Method and its Initial Evaluation

Abstract

Context: Uncertainty is an unavoidable issue in software engineering and an important area of investigation. This paper studies the impact of uncertainty on total duration (i.e., make-span) for implementing all features in operational release planning.

Objective: The uncertainty factors under investigation are: (1) the number of new features arriving during release construction, (2) the estimated effort needed to implement features, (3) the availability of developers, and (4) the productivity of developers.

Method: An integrated method is presented combining Monte-Carlo simulation (to model uncertainty in the operational release planning (ORP) process) with process simulation (to model the ORP process steps and their dependencies as well as an associated optimization heuristic representing an organization-specific staffing policy for make-span minimization). The method allows for evaluating the impact of uncertainty on make-span. The impact of uncertainty factors both in isolation and in combination are studied in three different pessimism levels through comparison with a baseline plan. Initial evaluation of the method is done by an explorative case study at Chartwell Technology Inc. to demonstrate its applicability and its usefulness.

Results: The impact of uncertainty on release make-span increases – both in terms of magnitude and variance – with an increase of pessimism level as well as with an increase of the number of uncertainty factors. Among the four uncertainty factors, we found that the strongest impact stems from the number of new features arriving during release construction. We have also demonstrated that for any combination of uncertainty factors their combined (i.e., simultaneous) impact is bigger than the addition of their individual impacts.

Conclusion: The added value of the presented method is that managers are able to study the impact of uncertainty on existing (i.e., baseline) operational release plans pro-actively.

Keywords: Operational release planning, uncertainty, impact analysis, discreteevent simulation, heuristic optimization, explorative case study.

About the Speaker:

Ahmed Al-Emran is currently a PhD candidate in the Department of Electrical and Computer Engineering at the University of Calgary. He is doing his research in the field of software engineering in general. More specifically, he works under the supervision of Dr. G. Ruhe and Dr. D. Pfahl to provide decision support for software release planning by analyzing impact of uncertainty on planning quality attributes namely make-span, schedule structure, and resource allocation. He holds a number of scholarships from major funding agencies like the Killam Trust, iCORE, and NSERC for his PhD research. He has published five journal articles, six conference papers, and one workshop paper so far. 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.

