جامعة عبد المالك السعدي
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Université Abdelmalek Essaadi

Centre des Etudes Doctorales Sciences et Techniques
&
Sciences Médicales

THESIS DEFENSE

Mrs. Sara MALLAH

CANDIDATE FOR DOCTOR SCIENCES AND TECHNIQUES

Design of port supply-chain planning/control integration and development of an architecture's component, the routing sub-optimize

Date :	**Saturday, December 23th, 2023**
Time :	**11.00 am**
Location :	**Conference Room, ENSA - Tangier**

Committe Members		
Pr. Abdelouahid LYHYAOUI	ENSA - Tangier	Chair
Pr. Khalid BENJELLOUN	EMI - Rabat	Reviewer
Pr. Abdelhakim KHATAB	Loraine University - France	Reviewer
Pr. Abderrazak BOUMANE	ENSA - Tangier	Reviewer
Pr. Khalid KOUISS	Clairmont Ferrand University - France	Examiner
Pr. Ahmed CHEBAK	UM6P - Benguerir	Examiner
Pr. Malek MASMOUDI	Sharjah University - UAE	Guest
Pr. Oulaid KAMACH	ENSA - Tangier	Supervisor

ABSTRACT

In order that real-world port supply-chains can overcome the knock-on effects of time of crisis (e.g., a pandemic), there must be a genuine resilience established to use port operations efficiently. The resilience needed requires for the planning, scheduling and control integration problem to be architected as a two-level inte gration to aim for the first levels of autonomy in complex supply-chains. In other words, the objective that enables achieving the first levels of autonomy hence, the resilience, is two-fold. First, integrating the plan ning and optimization tool with the control system so that the planning and optimization tool generates plans satisfying constraints reflecting real aspects of the industrial setting and hence that are able to be executed on physical equipment. The other way around, so that the control system can execute "well-thought" plans (optimal or near-optimal plans) computed using state-of-the-art optimization methods instead of arbitrary set-points. Second, moving to the planning tool in particular, we realize that bulk-port planning problem includes problems that work towards different business targets. This would lead to lost sales and substan tial penalties if the integration is not set up. While the research community debates on how to integrate these different port decisions in one model and thus to get the problems optimized simultaneously, in this research, conversely though, another integration approach, considering the planning problems as separate optimization sub-systems with interaction constraints, is proposed. Finally, we choose to develop a critical component of this architecture, which is the routing sub-optimizer using a linear program (LP), and a set of hybrid approaches. The study achieved shows interesting results and presents research opportunities for planning/control integration problem for a genuine resilience of port supply-chains.