

Proposal for Open Invited Track on “Control and coordination for sychromodal transport systems”

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Abstract:

This is a proposal for an Open Invited Track on “Control and coordination for synchronomodal transport systems” for the 20th World Congress of the International Federation of Automatic Control, to be held in Toulouse, France, 9-14 July 2017. Synchronomodal freight transport is a recent idea, corresponding to an advanced concept of intermodal freight transport, relying on mode-free booking services, on-line planning and real-time flexible selection of the transport modalities on the basis of the current logistics information. The efficient management of this type of transport requires very complex and sophisticated optimization and control methods. The proposed Track for the IFAC 2017 World Congress could be an interesting opportunity for researchers to discuss and compare innovative control approaches for synchronomodal freight transport.

1. DESCRIPTION

In global freight transport, major deep-sea ports act as gateways for import and export cargoes for certain geographical areas. These geographical areas are called the hinterlands of the deep-sea ports. Hinterland transport among deep-sea ports and inland terminals has been facing challenges due to increasing cargo volumes, limited capacities of transport infrastructures, traffic congestion on freeways, traffic emission issues, etc. Intermodal freight transport operators strive to organize hinterland transport in an efficient and sustainable way with the integrated use of different modalities (e.g., trucks, trains, barges) over an Intermodal Freight Transport Network (IFTN) [1, 2, 3].

Synchronomodal freight transport moves one step forward from intermodal freight transport by adopting the mode-free booking concept and allowing flexible selection and timely switching among multiple available modalities at any time during the freight transport process [4, 5]. This on-line decisions are normally taken on the basis of the latest logistics information, e.g., the transport demand, the traffic state, the available transport capacities in the logistic process.

In order to obtain efficient synchronomodal freight transport systems, it is first of all necessary that each modality is organized effectively, thanks to suitable network planning and control approaches. Then, it is also crucial that ad hoc coordination methods are studied and developed in order to synchronize different modalities for real-time booking services and on-line planning procedures.

In this Open Invited Track, we explore how optimal control and optimization methods can be adopted and applied to realize truly synchronomodal freight transport services.

Specifically, this Track is devoted (but not limited) to the following topics:

- (distributed) control for seaport hubs, container terminal, and intermodal terminals;
- (distributed) control for road vehicles and road networks;
- (distributed) control for vessels, locks, and water networks;
- (distributed) control for rail systems, trains and rail networks;
- coordination methods for synchronomodal freight transport systems.

The organizers believe that this Open Invited Track is an interesting opportunity for discussion and debate among researchers working on the definition of optimization and control techniques applied to transport systems and freight logistic networks. The final goal is to strengthen the common vision on control and coordination for synchronomodal transport systems and to promote collaborations among researchers.

The IFAC technical committee for evaluation is: **TC 7.4 Transportation systems.**

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