

PhD: Coordinated Control for Predictive Synchronomodality

Faculty/department Mechanical, Maritime and Materials Engineering
Level Master degree
Maximum employment Maximum of 38 hours per week (1 FTE)
Duration of contract 4 years
Salary scale 2222 to €2840 per month gross

Mechanical, Maritime and Materials Engineering

The 3mE Faculty trains committed engineering students, PhD candidates and post-doctoral researchers in groundbreaking scientific research in the fields of mechanical, maritime and materials engineering. 3mE is the epitome of a dynamic, innovative faculty, with a European scope that contributes demonstrable economic and social benefits.

The Transport Engineering and Logistics (TEL) section is part of the Department of Maritime and Transport Technology in the Faculty of Mechanical, Maritime and Materials Engineering (3mE) at Delft University of Technology. The focus is on the development, design, construction and operation of transport systems and equipment. Education and research deals with transport-related topics that involve both technological and logistic issues. This combination of transport technology and logistics is considered one of the strong points of the TEL section.

The Transport Engineering and Logistics section is seeking a talented and ambitious PhD candidate for a challenging multidisciplinary research project on (distributed) control and optimisation for synchronomodal logistics. The PhD position is defined within the framework of the NWO project "Complexity Methods for Predictive Synchronomodality (COMET-PS)".

Job description

Large-scale transport and logistics systems are key in satisfying societies' demand for more reliable and efficient delivery of goods. Real-time information availability via huge numbers of sensors and the widespread availability of computation and communication power enable the development of new, real-time control and coordination strategies. Synchronomodality is a promising concept that explicitly aims at benefitting from these developments to optimise transport logistics.

In this project, your goal is to propose and evaluate new methods that properly deal with the inherent complexity of synchronomodal freight transport systems. You will hereby consider as a starting point the existence of multiple controllers / decision makers. Information is assumed not to be available at a central location but instead distributed over a number of different locations, and this information can include uncertainty. Moreover, decisions are not made by a single decision maker, but by multiple decision makers. Interactions among these decision makers in terms of exchange of different types of information lead to various ways of negotiation and cooperation strategies. Considering the decision makers all together, you will propose a distributed optimisation problem setting, in which multiple optimisation problems need to be solved, taking into account interconnecting constraints and objectives. The main challenge then becomes how to solve this distributed problem, taking into account information sharing constraints and degrees of uncertainty. You will work with the industrial users in the project on realistic case studies in order to assess the

potential of different coordination strategies.

Requirements

We are seeking an outstanding and enthusiastic researcher who has expertise and/or interest in one or more of the following areas:

- Automatic control, distributed control, predictive control, multi-agent systems;
- Mathematical programming, robust optimisation, stochastic assignment problems;
- Freight logistics, synchromodal transport, container/bulk transport.

You have obtained an MSc or an equivalent degree or expect to obtain an MSc very soon related to these areas (Control; Transport & Logistics; Operations Research; Computer Science / AI; Mathematics). Good spoken and written English and the ability to work in a team are mandatory.

Conditions of employment

The TU Delft offers a customisable compensation package, a discount for health insurance and sport memberships, and a monthly work costs contribution. Flexible work schedules can be arranged. An International Children's Centre offers childcare and an international primary school. Dual Career Services offers support to accompanying partners. Salary and benefits are in accordance with the Collective Labour Agreement for Dutch Universities.

As a PhD candidate you will be enrolled in the TU Delft Graduate School. The TU Delft Graduate School provides an inspiring research environment; an excellent team of supervisors, academic staff and a mentor; and a Doctoral Education Programme aimed at developing your transferable, discipline-related and research skills. Please visit <http://graduateschool.tudelft.nl/> for more information.

Information and application

For more information about these positions, please contact R.R. Negenborn, phone: +31 (0)15-2786718, e-mail: r.r.negenborn@tudelft.nl. To apply, please e-mail an up-to-date, detailed curriculum vitae, a letter of application, a transcript of grades obtained during your MSc studies, and the names and contact information (telephone number and e-mail address) of two references by October 15, 2017 to: application-3mE@tudelft.nl. When applying for this position, please refer to vacancy number 3ME17-42.