

Preface

Computational logistics comprises the planning and implementation of large, complex logistics tasks using computations and advanced decision support and control. It is applied in various areas, such as for finding the most efficient scheduling/plan for the transport of passengers or goods. Optimization models and solution algorithms are integrated with advanced computer technology for getting satisfactory results in appropriate time and providing interactivity, visualization, etc., for a better understanding and problem solution. Computational logistics also involves the use of information systems and modern communication and information technology for the design, planning, and control of large-scale logistics networks as well as the complex tasks within them.

The International Conference on Computational Logistics (ICCL) provides an opportunity for researchers and practitioners in the field of computational logistics to present their latest results and findings in a fruitful and open-minded environment. This volume of the Lecture Notes in Computer Science series consists of selected papers presented at the 6th International Conference on Computational Logistics, held and organized by Delft University of Technology (TU Delft), Department of Maritime & Transport Technology, in Delft, The Netherlands, September 23–25, 2015.

The Department of Maritime & Transport Technology proposes new tools for design, control, simulation, and optimization that are based on fundamental innovations and new insights gained into the physics of continuous transport phenomena, as well as the development of agile logistic control systems for transport systems using distributed intelligence. This research is carried out in close cooperation with several other research groups within TU Delft. TU Delft aims to make a significant contribution towards a sustainable society for the twenty-first century by conducting ground breaking scientific and technological research and by helping to translate theoretical knowledge into technological innovations and activity of economic and social value. Logistics is an important pillar in this – especially for the business ecosystem of The Netherlands. The Netherlands holds a top position at international level as far as logistics, handling of good flows, and chains of (inter)national logistics operations are concerned. With only 0.25 % of the world's population and 1 % of world production, The Netherlands still provides 3.7 % of world trade. It is the Dutch government's ambition to strengthen this international position: The Netherlands aims to reach in 2020 the European number 1 position in the World Logistics Performance Index. The Port of Rotterdam, a stone's throw from Delft and one of the largest ports worldwide, is a crucial interconnecting factor in reaching and maintaining such a top position. The port strives to become the most efficient, safe, and sustainable port in the world – automation, advanced decision support, control, and information (community) systems are the core technologies constantly being developed further for facilitating this.

The special theme of ICCL 2015 is Coordination for Real-Time Logistics. This refers to the scientific and practical interest of approaches that are able to control and coordinate in real time multiple components involved in transport and logistics processes. A general trend especially in computational logistics is to strengthen its

theoretical and modeling basis. To achieve system performance, the distributed nature of logistical transport processes (in space, stakeholders, and time dimensions) needs to be taken into account explicitly; inclusion of coordination in control schemes specifically tailored for logistical processes is therefore crucial. This would allow day-to-day, hour-to-hour, minute-to-minute, real-time control of operations. For instance, transport flows over multiple modes (including rail, water, intermodality, and/or synchromodality), need to be controlled, while dealing with real-time dynamics. In general, uncertainty phenomena require that action plans are not merely determined, but also updated in real time by some form of closed loop depending on actual circumstances.

After a thorough review process, a grand total of 66 contributions were accepted, prepared by researchers from over 30 countries. Compared with previous ICCL conferences, this marks a great increase in academic output, making this year's ICCL a cornerstone in the visibility and participation in this emerging field. Following the focus of the papers accepted, the contributions were grouped into the following themes:

- Part I: Transport over Ground
- Part II: Transport over Water
- Part III: Internal Coordination within a System
- Part IV: External Coordination among Systems

While we believe that these proceedings provide insights into the state-of-the-art of the field, we also expect that the development of these themes will continue to grow. To support this, a few critical areas have been recognized as the frontier where a better match between practical needs, policy requirements, and innovative academic contributions is sought. These include further integration of mono-approaches; fostering usage of large-scale computational techniques to tackle the complexity of coordination; the application of innovative models that are already used for specific modes, such as vehicular traffic, to more complex multimodal or synchromodal situations; and inclusion of autonomy in the vehicles.

Organizing a conference and publishing the proceedings takes significant effort, for which we are endowed to the support of a large group of people. The greatest thanks go to the authors, who kept the scientific debate open and at a high qualitative standard. In addition, we greatly appreciate the valuable cooperation with the members of the International Organizing Committee and Program Committee, who worked hard at organizing and evaluating the papers to achieve a high scientific standard. A special thanks goes to the enthusiastic local organizers in Delft, in particular Céline Dohmen and Wouter Beelaerts-van Blokland. We moreover thank conference partners Dinalog, Transport Institute TU Delft, Science Centre Delft, and TransportNET.

ICCL 2015 in Delft was the sixth of its kind, after Shanghai (2010, 2012), Hamburg (2011), Copenhagen (2013), and Valparaíso (2014). The contributions presented at ICCL 2015, and the papers in these proceedings, show that computational logistics is getting ready to be put to work. We look forward to the next steps!

Computational Logistics

6th International Conference, ICCL 2015, Delft, The Netherlands, September 23-25, 2015, Proceedings

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2015, XV, 752 p. 215 illus. in color., Softcover

ISBN: 978-3-319-24263-7