Editorial

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Biographical notes: Petri T. Helo is a Research Professor in the Logistics Systems Research Group at the University of Vaasa, Finland. He received his PhD in Production Economics from the University of Vaasa, Finland in 2001. He is also involved in developing logistics information systems at Wapice Ltd. as a partner. His research addresses the management of logistics processes in supply demand networks, which take place in electronics, machine building and food industries. His areas of expertise include agile manufacturing, technology management and system dynamics.

Maria Cristina Fogliatti de Sinay graduated in Mathematics at the Institute of Mathematics, Astronomy and Physics at the National University of Córdoba, Argentina, in 1971. She obtained Master degree at the Queens College of the City University of New York USA in 1975 and her Doctoral Degree at the Graduate Center of the City University of New York, USA, 1978. She was also engaged in a Pos Doctoral Program in Applied Mathematics at the University of California, Campus San Diego in 1989/1990. She worked for 30 years in Brazilian Universities and retired in March, 2010. She had tenure at the Military Institute of Engineering where she acted as a Full Professor in a Master Program in Transportation Engineering. Her fields of research are Applied Mathematics and Statistics, Operations Research, Probability, Statistics and Environmental Management.

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The importance of quantitative modelling in solving logistics problems is obvious. Analysing alternative scenarios for supply chains, developing decision-support tools for tactical decisions, or improving operations by optimisation, all require use of quantitative techniques. Applications on solving practical logistics include various techniques from simulation to algorithms and mathematical optimisation. This special issue entitled "Modelling in Logistics" presents how modelling approach in the field of industrial logistics can be used to combine theory and practice in a range of applications. Eight application papers have been selected to compose the present volume on the basis of their relevance and potential contribution to the area of logistics research and applications. It includes both theoretical and practical papers on the improvement of logistical operational management in a range of industries. Earlier versions of papers have been presented at International Conference on Industrial Logistics (ICIL 2010) hosted by Military Institute of Engineering – IME with cooperation of Federal University of Espírito Santo (UFES) and COPPE/Federal University of Rio de Janeiro (UFRJ) between 8 and 10 March 2010.

The first paper, 'A hybrid heuristic, based on Iterated Local Search and GENIUS for Vehicle Routing Problem with Simultaneous Pickup and Delivery' by Marcone Jamilson Freitas Souza, Marcio Tadayuki Mine, Matheus de Souza Alves Silva, Luiz Satoru Ochi and Anand Subramanian, deals with the Vehicle Routing Problem with Simultaneous Pickup and Delivery (VRPSPD), which is a common problem in the area of reverse logistics. It aims to plan the transportation of products to customers, as well as the return of leavings or products used by them for recycling or to special depots. This kind of problem is NP-hard, since it can be reduced to the classical Vehicle Routing Problem when no client needs the pickup service. To solve it, the authors propose a hybrid heuristic algorithm, called GENILS.

The second paper, 'An approach for the sustainable integration of production and transportation scheduling' by Bernd Scholz-Reiter, Enzo Morosini Frazzon, Thomas Makuschewitz, Antônio G.N. Novaes and Orlando Fontes Lima, deals with the conceptual gap for the dynamic integration of production and transportation systems along supply chains, integrating production and transportation scheduling problem (PTSP) for an Original Equipment Manufacturer (OEM) as a Mixed Integer Program (MIP). The program combines an open flow shop problem and vehicle routing problem. Current capabilities of transportation and production systems as well as a rolling time horizon are taken into account by the formulation.

The third paper, 'Clustering and routing model for transport logistics using software agents' by Gulshanara Singh, Carmelita Görg and Andreas Timm-Giel, uses a cluster-based Distributed Routing Logistics Protocol (DLRP) approach in a software-agent-based simulation framework to match the routes of vehicles and goods in a dynamic network environment.

The fourth contribution, 'A genetic algorithm approach to a 3D container-loading problem' by Raúl Pino, Isabel Fernández, David de la Fuente and Nazario García, presents a genetic algorithm application to the container loading problem trying to maximise the cargo volume accommodated in the container whilst ensuring that loading restrictions are met, and thus achieving a reduction in the number of freight to hire and thereby a reduction in costs. This could be done using software that assists the container loading process.

The fifth paper, 'A comparison of mathematical modelling approaches for stability analysis of supply chains' by Bernd Scholz-Reiter, Thomas Makuschewitz, Fabian Wirth, Michael Schönlein, Sergey Dashkovskiy and Michael Kosmykov, addresses the problem of choosing a proper mathematical modelling approach for a real-world network to investigate stability. Different modelling approaches were tested each one considering different characteristics of a supply chain and features a specific stability criterion.

The sixth contribution, 'An efficient ant colony system for Vehicle Routing Problems with Time Windows' by Orivalde S. Silva Jr. and José E. Leal, presents an efficient algorithm based on metaheuristic multiple ant colony system for solving vehicle routing problems with time windows. This problem aims to determine the minimum cost routes for a fleet of vehicles of same capacity to meet the demand of a set of customers within a specified time interval called time window.

The final contribution, 'Risk on spares for life-time maintenance purposes due to uncertainties on the mean up time' by Raymond A. Marie, considers the case of a mono-production of a small quantity of complex and expensive systems, to determine the quantity of spares to be produced for life-time maintenance purposes, considering the steady-state mean up time uniformly distributed on a time interval.

The editors thank all the authors who have contributed the papers for this special issue and the reviewers. Special thanks are extended to the Editor-in-Chief, Professor Angappa Gunasekaran, who kindly invited us to edit this special issue of IJLSM.