



The University of Hong Kong
Department of Industrial and
Manufacturing Systems Engineering

HKU Laboratory for
Systems Analytics

Systems Analytics Global Leaders' Seminars



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The ASSISTANT project: AI for high level decision in manufacturing

This paper outlines the main idea and approach of the H2020 ASSISTANT (LeArning and robuSt deciSlon Support systems for agile mANufacTuring environments) project. ASSISTANT is aimed at the investigation of AI-based tools for adaptive manufacturing environments, and focuses on the development of a set of digital twins for integration with, management of, and decision support for production planning and control. The ASSISTANT tools are based on the approach of extending generative design, an established methodology for product design, to a broader set of manufacturing decision making processes; and to make use of machine learning, optimization, and simulation techniques to produce executable models capable of ethical reasoning and data-driven decision making for manufacturing systems. Combining human control and accountable AI, the ASSISTANT toolsets span a wide range of manufacturing processes and time scales, including process planning, production planning, scheduling, and real-time control; and are designed to be adaptable and applicable in a both general and specific manufacturing environments.

Alexandre Dolgui is a Fellow of IISE, Distinguished Professor and the Head of the Automation, Production, and Computer Sciences Department at the IMT Atlantique, campus in Nantes, France. His research focuses on manufacturing line design, production planning and scheduling, and supply chain engineering. His main results are based on exact mathematical programming methods and their intelligent coupling with heuristics and metaheuristics algorithms. He has contributed to the theory of assembly line balancing, combinatorial design of machining lines, process planning, supply chain scheduling, lot sizing and replenishment under uncertainties. He is the editor-in-chief of the International Journal of Production Research, an area editor of Computers & Industrial Engineering, a member of the editorial boards for several other journals, including the International Journal of Production Economics, Fellow of the European Academy for Industrial Management, Member of the Board of the International Foundation for Production Research, former Chair of IFAC TC 5.2 Manufacturing Modelling for Management and Control, and Member of IFIP WG 5.7 Advances in Production Management Systems.

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