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Vicenc Puig

Universitat Politecnica de Catalunya, Spain

A methodology for the global process management of the production processes in the EnReMilk project

In this presentation, a methodology for the global process management of the milk and yogurt production processes used as a case study in the European project EnReMilk will be described. At the beginning, three strategies were considered taking into account several aspects of the process management, namely: safety management, production optimization and system optimization. After analyzing the three strategies, the consortium of project agreed to focus on the development of the production optimization. The production optimization problem addresses the optimal batch scheduling of a real power milk/yoghurt process by means of a constraint programming approach. First, the process and production rules are modeled using a set of constraints. Then, an objective function that includes the process optimization criteria is defined. After the definition of the constraints and objective function, an optimization problem that is formulated and solved using a constraint programming solver, namely the IBM ILOG Optimization Studio. A set of scenarios changing the consume ratio of evaporators, that consider an uninterrupted 15 full days in the underlying powdered milk and yogurt production facilities, are presented to illustrate the validity and performance of the proposed approach.

Biography

Vicenc Puig has completed his Telecommunications Engineering degree in 1993 and PhD degree in Automatic Control, Vision, and Robotics in 1999, both from Universitat Politecnica de Catalunya (UPC). He is a Professor at the Automatic Control Department and a Researcher at the Institut de Robòtica i Informàtica Industrial, both from the UPC. He is the Chair of the Automatic Control Department and Head of the research group in Advanced Control Systems at UPC. He has developed important scientific contributions in the areas of fault diagnosis and fault tolerant control using interval and linear-parameter-varying models using set-based approaches. He has participated in more than 20 European and national research projects in the last decade. He has also led many private contracts with several companies and has published more than 100 journal articles and more than 400 in international conference/workshop proceedings. He has supervised over 15 PhD dissertations and over 40 Master's theses/final projects.

vicenc.puig@upc.edu

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