Research Topic for the ParisTech/CSC PhD Program

Subfield: Industrial engineering

ParisTech School: ENSAM Lille

Title: Reconfigurable production system: adaptability to variability of products and quantities

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Short description of possible research topics for a PhD:
Industry 4.0 is the main international program which aims at improving the operational system in industries. More and more companies are concerned by this approach. Internet of objects can be one proposition: “objects” are connected to ease the communication, but other improvements can be envisaged. At a bigger level, an integration of the whole production system is needed. Managers need to fully control the production, the actual one and the future one. But how can the future demand be integrated without major changes in the actual layout? The production system needs to be flexible to the variety of products and to the quantities of products. A lot of problematics are concerned by this 4th industrial revolution: sizing of the shop floor, sizing of resources, planning of activities, assignment of resources, scheduling of activities. Some aid decision tools can be proposed to help the manager. To do so, we also need to consider some new trends such as continuous improvement, big data or collaborative robotics. For instance, it would be necessary to use the data in the shop floor to treat them in live to adapt the schedule and planning to the hazards, a link with the used ERP by the company needs to be done. Thanks to collaborative robotics, flexible production means can be used in our future flexible and agile production system, which will be reconfigurable. Many companies are actually thinking about converting their actual system into a reconfigurable production system.

Required background of the student: Industrial engineering, supply chain management, operational research, information system

A list of 5(max.) representative publications of the group: