Title of the thesis : Development of optimized production planning approaches to manage complex production lines

Laboratory: Ecole des Mines de Saint-Etienne - UMR CNRS LIMOS 6158, Campus Georges Charpak Provence, Gardanne (Bouches-du-Rhône), France.

Company: STMicroelectronics, Crolles (Isère), France.

Duration and starting date: The position is for three years starting as soon as possible. The position will remain open **until fulfilled**.

Funding : ANRT – CIFRE thesis.

Supervision

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Keywords: Combinatorial optimization, production planning, decomposition approaches, semiconductor manufacturing.

Objectives of the PhD thesis :

In semiconductor manufacturing, operational production planning is the bridge between tactical production planning, which defines the delivery and production start plans, and local scheduling decisions. Operational production planning considers the detailed characteristics of the manufacturing facility (product routes, machines, operation eligibility, etc.) to define production targets to manage control flows. This function is currently provided by a homemade tool, whose heuristic approach is running out of steam. Recent PhD theses conducted with STMicroelectronics and the Ecole des Mines de Saint-Etienne proposed novel modeling and solution approaches based on column generation, and recent studies have shown the possibility of extending this approaches to industrial data from the STMicroelectronics Crolles manufacturing facility. The objective of the thesis is to build on this work to propose a new production planning approach to provide production plans that consider the main constraints and optimize different key indicators such as the linearity of the fab, the control of cycle times, the satisfaction of delivery dates and time constraints, the use of machines, etc.

Candidate profile:

Applicants must have a Master Degree (or equivalent) in Operations Research, Applied Mathematics, Computer Sciences or any related discipline. Applicants should demonstrate good programming skills and a deep knowledge in combinatorial optimization and integer programming.

Application procedure:

Please send your application electronically (preferably as a single pdf file) including a detailed curriculum vitae and examination results, plus, if available, a list of reference letters and copies of diploma, to: Nabil ABSI (absi@emse.fr), Stéphane Dauzère-Pérès (dauzere-peres@emse.fr) and Quentin Christ (Quentin.christ@st.com). The position will remain open until fulfilled.

Do not hesitate to contact us for further questions regarding the position.