

proposition sujet de mémoire **2014 - 2015**

MASTER Recherche 2^{ème} année

Management, Innovation, Technologie

spécialité « Génie industriel »

Titre

Knowledge Discovery from Unstructured Maintenance reporting by Technicians in Semiconductor Industry (SI)

Contenu du sujet proposé:

The semiconductor production line is characterized by high-mix low-volume production and short product life cycles that often result in increasing unscheduled equipment breakdowns and unstable capacities. It has been observed that failure occurrences, duration and number of repairs in its each occurrence has also increased which is clear evidence of increasing misdiagnosis in failure and its causes by maintenance engineers. One of the key reasons identified for this issue is our inability to process historical maintenance information entered by technicians during corrective and preventive maintenance operations. We believe, this information can play an important role to accurately find potential failure(s) and cause(s). Therefore, to reduce the unscheduled equipment breakdowns, we must support engineers with quality maintenance information during failure-cause diagnosis.

At present, comments and information on the execution of maintenance actions is entered in CMMS (computerized maintenance management system). There is a huge resource of this information, but we cannot exploit and generate useful information for maintenance engineers during failure-cause diagnosis, against new excursions. The reason is that this information is unstructured and there are no rules explicitly laid to write and enter this information. Hence, technicians add this information in the database like they want e.g. some times with special characters, sometimes either in English, French or mix of it, frequent use of personalized short acronyms etc. Such issues make it impossible to process these comments and generate useful knowledge.


The advanced text mining techniques can be used to generate personalized profiles for technicians followed by heuristic to either transform existing information into useful information or generate new aggregated information to support failure-cause diagnosis process. This further requires the proposition of an ontology for comments to be entered by technicians followed by a prototype to reason drifting equipment behaviours. The proposed internship has two clear objectives; (i) develop methodology to transform existing comments added by technicians into useful information using text mining techniques and (ii) propose and develop an ontology for comments to be added by the technicians with reasoning engine to support failure-cause diagnosis process.

This internship is to be completed at G-SCOP in collaboration with STMicroelectronics, Crolles. You will work in "INTEGRATE" project team; however, candidate may be either asked to do it at Crolles, 300mm production line or frequently visit Crolles 300mm production line for discussion with maintenance people. It requires strong programming (preferably Java) and analytical skills with high motivation to take this challenge.

- Quel parcours conseillez-vous : Supply Chain ou Product Development ? Supply Chain
liste des cours sur le site web du master

- Pour mener à bien le stage, il est souhaitable de suivre en cours optionnels le (s) enseignement(s) suivant(s) :

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