

# Research Topic for the Arts et Métiers ParisTech - CSC PhD Program

## Arts et Métiers ParisTech – LCFC – HOMRI 01

**Subfield:** Industrial Engineering, Production Engineering

**ParisTech School:** Arts et Métiers ParisTech campus de Metz

**Title:** quality management for product, process and production system

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### **Short description of possible research topics for a PhD:**

In the last decades, the egregious importance of total quality management has been completely clarified to all industries. In order to maintain profitable and stay in a competitive edge, reaching to high quality level of products, processes and services has been nowadays a vital issue in many manufacturing systems, while they cannot survive without assessing the quality as well as providing high quality products. In quality assessment of manufacturing systems, the most important task is to collect and analyze the data to solve quality related problems. Quality improvement programs such as design for six sigma (DFSS), six sigma ( $6\sigma$ ), and kaizen are encouraging quality managers to collect data to attack quality problems, while advances in automation and computer systems. Quality problems nowadays involve several input parameters that are not possible for accurately being modeled and/or optimized regarding their uncertainties

The main objectives of the proposal are:

1. Development of integrated approaches for the quality management of products, process and production system
2. Consideration of parameters uncertainties in the models.

### **Required background of the student:**

The candidate must have a master degree in industrial engineering or mechanical engineering. Skills on mathematics will be appreciated.

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

1. Rostami, H., Dantan, J.Y. and Homri, L., 2015. "Review of data mining applications for quality assessment in manufacturing industry: support vector machines". International Journal of Metrology and Quality Engineering, 6(4), p.401.
2. Bassetto, S., Siadat, A., Tollenaere, M. "The management of process control deployment using interactions in risks analyses", (2011) Journal of Loss Prevention in the Process Industries, 24 (4), pp. 458-465.
3. Chou, P.H., Wua, M.J., Chen, K.K., 2010. Integrating support vector machine and genetic algorithm to implement dynamic wafer quality prediction system. Expert Systems with Applications, 37: 4413–4424.
4. Shokri, S., Sadeghi, M.T., Marvast, M.A., 2014. High reliability estimation of product quality using support vector regression and hybrid meta-heuristic algorithms. Journal of the Taiwan Institute of Chemical Engineers, 45: 2225–2232.

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