Big data mining for Industry 4.0: opportunities and challenges

Proposers: Bianca M Colosimo, Kamran Paynabar, Fugee Tsung, Qiang Huang

Fostered by *Industry 4.0,* complex and massive data sets are currently available in many industrial settings. On the one hand, the product quality is characterized by **free-form complex shapes**, measured via non-contact sensors and resulting in large unstructured 3D point clouds. On the other hand, in-situ and in-line data are available as multi-stream **signals, image and video-images**. In this framework, novel solutions for functional data monitoring, manifold learning, spatio-temporal modelling, statistical monitoring of multi-steam data are needed to face the current industrial challenges.

This session focuses on novel solutions for big data mining in the framework of Industry 4.0: an overview of methods and tools is presented and discussed to highlight opportunities and challenges in this new scenario.

Four contributions are specifically foreseen:

1) An Adaptive Sampling Strategy for Online Monitoring and Diagnosis of High-dimensional Streaming Data

Authors: Ana Maria Estrada Gomez, Dan Li, Kamran Paynabar (kamran.paynabar@isye.gatech.edu)

School of Industrial and Systems Engineering, Georgia Institute of Technology, Atlanta, GA

2) Extended Fabrication-aware Convolution Learning Framework for Predicting 3D Shape Deformation in Additive Manufacturing

Yuanxiang Wang <yuanxian@usc.edu>, Cesar Ruiz <cesarrui@usc.edu>, and Qiang Huang qiang.huang@usc.edu

University of Southern California (USA)

3) Real-time customer satisfaction evaluation and monitoring using online text mining and data fusion

Yinghui HUANG <yhuangda@connect.ust.hk> and Fugee Tsung <season@ust.hk>

Hong Kong University of Science and Technology

4) Spattering as a driver of process control in Additive manufacturing via spatio-temporal modeling of videoimages

Marco Grasso and Bianca Maria Colosimo <biancamaria.colosimo@polimi.it>

Politecnico di Milano - Italy