



Smart Manufacturing and Optimization Research Group

Smart manufacturing and optimization research group (SMARTMAN) aims to advance in the fields of smart manufacturing, materials science and engineering. Our research group consists of manufacturing and industrial engineers from Kadir Has University in Istanbul, Turkey.

Field of Interest – We mainly focus on (1) data-centered online feedback control of manufacturing systems and (2) predictive maintenance and diagnostic models for machine failures in production systems. These require not only rigorous mathematical models, but also having data validation systems in place. Particularly, virtual sensors are crucial for maintaining high quality data to be used in feedback control.

Predictive maintenance by utilizing data mining techniques and stochastic modeling is another focus area of our research. We aim to develop empirical models and maintenance policies that can be combined with classical corrective and preventive maintenance control systems.

From a methodological perspective, we utilize materials science, machine learning, stochastic modeling, process control, and dynamic optimization for developing applicable manufacturing solutions. In addition, we employ linear and nonlinear mathematical programming, statistical inference, and data mining techniques to create *applications of our theoretical models* in practice.

Our Experience - Our research group consists of successful academicians who has published in respected journals. We were able to receive a significant research grant from the Turkish Scientific and Technological Research Institute (TUBITAK). In this research project, we aim to focus on control and monitoring of capital products to achieve high efficiency and cost reduction.

In addition to these significant research experience, researchers in our group have been involved with research and consulting projects that aim to develop optimum solutions for spare parts management problems at Fokker Services in the Netherlands for five years. Moreover, we work as the scientific expert and consultant in a spare parts optimization projects at Turkish Technic, which is a Maintenance Repair Organization providing service for Turkish Airlines in Istanbul.

Our role as a partner - We are particularly interested in finding partners in H2020 calls targeting smart manufacturing, validation of sensor data, and diagnostic models with capabilities of advance failure detection and assessment of remaining lifetime, while working together with traditional control policies.

Currently we are targeting DT-FOF-11-2020 and we are interested in taking an active role and collaborate in design, development, and implementation phases of potential research projects towards this call.

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