

**Project:** Smart manufacturing cell for AI-based proactive quality control of machined surfaces

**Research team:**

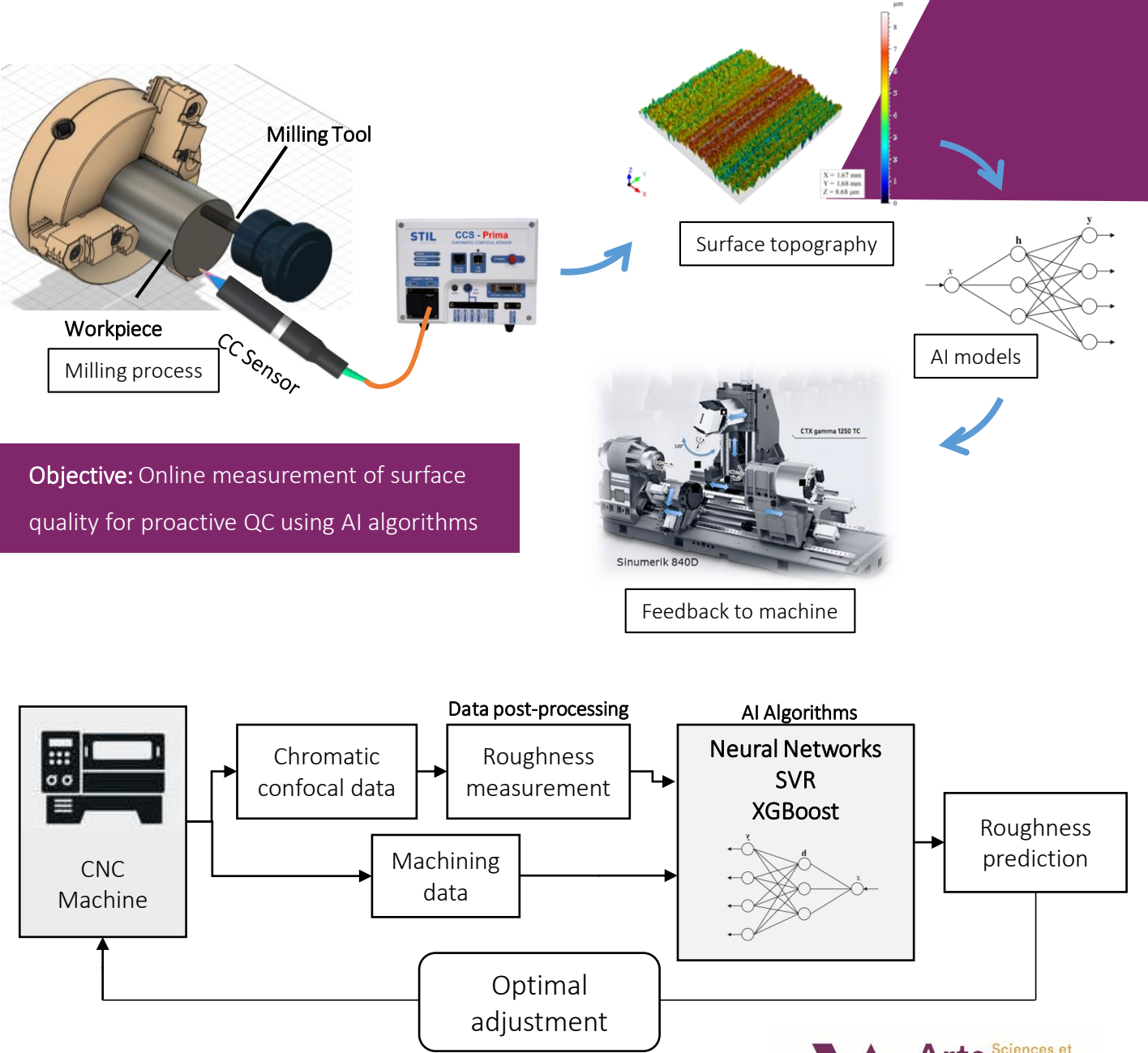
- Dr. Ricardo KNOBLAUCH (head)
- Prof. Mohamed EL MANSORI (supervisor ENSAM)
- Prof. Satish Bukkapatnam (supervisor TAMU)
- MSc. Hassan CHOUHAD (PhD student)
- Alexandre Mira (Technician)

**Description:**

In this project, a 5-axis CNC machine-tool is sensorized and connected to an external PC. The analyzed variables of the machine are the cutting parameters and the surface quality of the machined surfaces, which is measured by Chromatic Confocal technology provided by the industrial partner. The data generated is employed to train and test different AI algorithms so a model for surface quality prediction can be created. The final goal is to have an online surface quality control system that monitors the machining process and feedbacks the machine-tool based on non-contact surface measurements done in-process together with AI models.

**Partners:**

Stil Marposs



**Project:** Surface defect detection/classification using AI algorithms

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Alexandre Mira (Technician)

**Description:**

Use of a high-resolution chromatic confocal camera from industrial partner to analyze the surface laser-machined surfaces and detect eventual defects generated in the production line. Smart data is employed in AI models such as Decision Trees, Random Forest, Multi-Layer Perceptron and Convolutional Neural Network to find the most accurate classifier.

**Partners:**

Stil Marposs

