

Faculty of Engineering

Summer Research Program 2023-2024

Project Title: Sensor Fusion In-situ Monitoring for 3D Printers

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Objective

To utilize various sensors to gather data and establish relationships between the collected data and print quality, in order to make recommendations for machine adjustments and maintenance.

Project Details

FDM 3D printers are an economical solution for additive manufacturing and have gained popularity in recent years. However, the quality control of economical printers remains a major obstacle to their wider application. In this project, we aim to supervise the manufacturing process of FDM 3D printers by fusing data from various sensors. Students are required to use multiple sensors such as microcams, webcams, vibration sensors, acoustic sensors, and current sensors to monitor the state of 3D printers, collect data, and conduct analyses. They need to establish correlations between sensor data and the quality of printed parts to identify and predict abnormalities in 3D printing such as nozzle clogging, extrusion interruption, and printing failure. This will also aid in predictive maintenance. Analytical methods can include statistics, machine learning, neural networks, and AI without limitations.

Prerequisites

Students are expected to have a passion for and experience in data analysis.