Symbol Recognition Study in Piping and Instrumentation Diagram(P&ID) : A Heuristic Based Method

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Over the past few years, a technology for automatic, or semi−automatic, symbol recognition in engineering drawings has been demanded for improving effectiveness and productivity in many industrial field. However, due to several specific characteristics of the engineering drawing, such as large amount of connected−lines between symbols, similarity of different symbol classes, etc, the symbol recognition has been studied as a challenging task. In this presentation, the framework consists of two parts: Regions of Interest (ROI) detection and ROI classification. First, we consider the characteristics of a Piping and Instrumentation Diagram (P&ID), which is one of the types of the engineering drawings. After setting target symbols, like valves symbols (or instrumentations), we set an algorithm for detecting ROI in test P&ID, reflecting previous considerations. Organizing the detected ROI, we make a dataset for supervised machine learning model to solve ROI classification problem. Using Support Vector Machine with kernel function, we go through several re−training processes to increase accuracy, and finally, get competitive results.