

Deep Neural Network for Automatic Recognition of Engineering Diagrams

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Engineering diagrams are commonly used in plant industry fields and most of them contain lots of information for the plant, such as pipelines, valves, instruments, notes, and so on. Recently, to recognize these symbols and digitalize the diagrams automatically, there have been several pieces of research, using machine vision methods. Despite advances in skills of symbol recognition, it is still far to apply these technologies to real-world projects. In this work, implementing a deep neural network, we propose a semi-automatic framework to recognize the symbols in the diagram. The procedure is divided into 3: parallel region proposal, data preprocessing and classification. By using parallel image process, we propose all candidates of regions for each symbol in a diagram. To decompose the detected dummy automatically, unsupervised learning algorithms are used to annotate negative classes. In classification, a convolutional architecture is constructed. We test this framework on new diagrams and compare the results of only positive data with positive-negative one. Consequently, this work shows the results, which the accuracy is competitive in case of considering negative classes.

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