

Recognition Strategies in Machine Vision Applications

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Abstract

Since the 1970's, we have been developing technologies in industrial machine vision including intelligent character recognition to produce automated machines for factories, banks, and post offices. In my talk, I will first introduce a brief history of the industrial machine vision and the intelligent character recognition technologies in applied fields. Then I will discuss the strategies and developments in the fields. I will end my talk by touching on my personal experience as a researcher.

As time has passed, our major research objective has changed from factory automation to office automation and from office automation to social/security automation. Consequently, the demand for machines that are capable of dealing with more complex and difficult automation tasks has grown. To meet these demands, a machine often requires multiple recognition procedures. This normally leads to the final recognition rate worsening as the number of procedures increases. Therefore, we propose a multiple-hypothesis strategy and an information-integration strategy to improve the final recognition rate so that it can meet the machine's specification. Then, it will be shown that the rejection ability of the recognition procedures has an important role in using these strategies effectively. The usefulness of these strategies has been proved through the successful development of mail sorting machines, document readers, and intelligent automated teller machines. Those developments are also described in detail in my talk. Finally, I would like to touch on my experiences as an industrial researcher, which can be summed up by the phrases "practicality first, novelty second," "development first, research second," and "non-vision first, vision second."