基于迁移学习的盲文字符图像识别方法研究

摘 要

盲文作为一种特殊的文字，其应用范围局限于视障人士。盲文字符的识别对不懂盲文的成年视障人士和明眼人来说具有重要意义。本论文针对盲文字符图像的识别展开研究，提出一种基于迁移学习的方法对盲文字符进行识别。与传统的深度学习算法不同，迁移学习避免了对深层次卷积神经网络进行长达数周的训练，也不需要高性能的 GPU 和庞大的数据集。

首先，本文创建了盲文字符数据集，其中包括盲文字符 0-9，共 10 种盲文字符，每一种包括 240 张盲文图像。然后用迁移学习的方法对这 10 种盲文字符图像进行识别。实验结果显示，该方法取得了 54.02%的正确率。

该方法具有比较好的理论意义和实践价值，一方面填补了基于深度学习方法对盲文字符图像进行识别的空缺；另一方面促进了明眼人与视障人士更好地交流与沟通，对构建和谐社会具有较好意义。

关键词：盲文字符；图像识别；迁移学习；深度学习

The RESEARCH ON BRAILLE CHARACTER IMAGE RECOGNITION BASED ON TRANSFER LEARNING

Abstract

As a special kind of language, Braille is quite limited to visually impaired people.This paper studies the recognition of braille character images and proposes a method based on transfer learning to recognize braille characters. Unlike traditional deep learning algorithms, transfer learning avoids weeks of training for deep convolutional neural networks and does not require high-performance GPUs and large data sets.

First, this paper created a Braille character data set that included Braille characters 0-9, a total of 10 Braille characters, each containing 240 Braille images. Then use the transfer learning method to identify the 10 Braille character images. The experimental results show that the method achieved a correct rate of 54.02%.

This method has relatively good theoretical significance and practical value. On the one hand, it fills in the vacancies based on deep learning method to recognize Braille character images; On the other hand, it promotes better communication and communication between discerning people and visually impaired people and has a good meaning in building a harmonious society.

Key words: Braille characters;Image Recognition;Transfer learning;Deep learning