深度学习在交通标志识别的应用报告

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# 摘要

随着社会的发展和进步，良好的交通同时促进着社会的快速发展，但现代交通的繁忙、堵塞和复杂的路况，在我们不断用更多的交通标识去规范出行时，也便增加了人们出行的麻烦，加大了交通事故的发生频率。在此背景下,各国开展了智能交通系统(ITS: Intelligent Transportation System)的研究。ITS被认为是解决以上问题的基本手段,其核心技术涉及数字信号处理、通信技术、图像处理、模式识别、人工智能和系统工程技术等,是一门综合性技术。道路交通标志识别(TSR)系统是智能车辆的重要组成部分,它在车辆行驶中对道路出现的交通标志进行信息采集和识别,及时地向驾驶员做出指示或警告,甚至接替驾驶员直接对车辆控制,以确保交通顺畅和防止事故的发生。

交通标志被广泛应用于道路交通中，由于受到许多不可控制因素如天气光照变化、物理遮挡、运动模糊等的影响，交通标志的准确检测和快速识别对研究者来说是一个重大的挑战。然而传统的目标检测方法在图像识别领域存在较高表达力的特征难以提取，特征分类的准确度和速度都较低，深度学习中卷积神经网络的发展，使得其在图像识别领域普遍存在两种应用方式，分别为基于分类的卷积神经网络目标检测，基于回归的卷积神经网络的目标检测，本文将就目前深度学习在交通标志目标识别领域的应用做出概述型的报告，以便实验室了解当前该领域的研究现状并有助于做进一步深入的研究。

**关键字: 深度学习, 交通标志, 目标识别**

# Abstract

With the development and progress of the society, good transportation also promotes the rapid development of society. However, the busy, blocked and complicated road conditions of modern transportation have increased people as we continue to use more traffic signs to regulate travel. The trouble of travel has increased the frequency of traffic accidents. In this context, countries have conducted research on the Intelligent Transportation System (ITS). ITS is considered to be the basic means to solve the above problems. Its core technology involves digital signal processing, communication technology, image processing, pattern recognition, artificial intelligence and system engineering technology. It is a comprehensive technology. The Road Traffic Sign Recognition (TSR) system is an important part of intelligent vehicles. It collects and identifies the traffic signs appearing on the road while the vehicle is running, promptly gives instructions or warnings to the driver, and even takes over the driver directly, for ensuring smooth traffic and prevent accidents.

Traffic signs are widely used in road traffic. Due to many uncontrollable factors such as weather illumination, physical occlusion, motion blur, etc., accurate detection and rapid identification of traffic signs is a major challenge for researchers. However, the traditional target detection method is difficult to extract in the field of image recognition, and the accuracy and speed of feature classification are low. The development of convolutional neural network in deep learning makes it popular in image recognition. The application methods are classification-based convolutional neural network target detection and regression-based convolutional neural network target detection. This paper will give an overview report on the application of deep learning in the field of traffic sign target recognition. The room understands the current state of research in this area and will help to further research.

**Keywords: Deep Learning, Traffic Signs, Target Recognition**

# 绪论

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## 国内外研究现状

### 交通标志检测方法研究现状

### 交通标志识别方法研究现状

# 基于分类的CNN交通目标识别应用

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# CNN交通标志分类简单实验

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## 总结

## 展望

# 参考文献