

# Mapping of Sri Lankan Road Signs by Using Google Street View Images

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**Abstract** - The development of autonomous vehicle driving systems and Intelligent Transportation System (ITS) have drawn massive attention since the 1980s. For the development of ITS, road sign detection and identification are considered to be very important due to the vital information provided by road signs. Generally, real-time video-based methods are used as the source of images for the operation of ITS. But they are inefficient and costly due to certain limitations like weather conditions, lighting conditions, and limited range in obtaining quality images. To overcome the limitations of the video-based approach, this research aims to develop techniques for detecting and identifying road signs by using Google Street View (GSV) as the image source, OpenCV for image processing and CNN for road sign identification. EdleNet, LeNet-5, and DenseNet were identified as accurate CNN models. Using images from GSV, generating a database of road signs with the relevant coordinates was possible, which is currently unavailable in Sri Lanka. In addition, this process leads to the generation of a valuable image dataset of Sri Lankan road sign images, and a web interface with mapped road signs. Consequently, this research would yield useful findings that may be applied to future research and provide the means to develop ITS, accident-avoidance systems, and driver assistance systems.

**Keywords** - Google Directions API, Google Street View (GSV), intelligent transportation systems, Machine Learning, road sign detection and identification