

Effective Recognition of the Ancient “Sthuupas” in Sri Lanka Using Machine Learning

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The Sri Lankan tourism industry faces significant challenges due to the global economic crisis, necessitating innovative solutions to revitalize the sector. In response, there is a strategic initiative to develop an automated tourist guide application, addressing the trend of tourists preferring independent exploration without guides. The primary focus of this application is overcoming the challenge of distinguishing visually similar structures, particularly *Sthuupa* (temple structures), characterized by shared appearances and colors. Leveraging current developments in deep learning, the suggested approach uses TensorFlow Object Detection API to train a complex model that can identify individual items in photos, even when the images are taken from different angles and in different environments. The DeLF model is used in the training process, which uses a variety of datasets combined from local and online sources. Google Colab is utilized to enhance computing efficiency. Enhancing the model's adaptability—specifically, molding it to recognize the subtle characteristics of Sri Lankan Sthuupas—requires transfer learning. Following a successful training phase, the application aims to smoothly implement the model, allowing users to recognize objects in real-time. The comprehensive development process encompasses meticulous stages such as data collection, preprocessing, model training, evaluation, and exportation in TensorFlow Lite format, facilitating seamless integration with mobile platforms. Further, the application will use GPS to filter the location of images. The overarching objective is to furnish tourists with a cost-effective, accurate, and user-friendly experience, aiding them in navigating historical sites independently while efficiently identifying visually similar *Sthuupa* structures.

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