ANCIENT TAMIL DECODING

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BONAFIDE CERTIFICATE

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ABSTRACT

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The preservation and interpretation of ancient scripts remain one of the most significant challenges in the fields of digital humanities and computational linguistics. Among these, the ancient Tamil script, found on inscriptions, palm-leaf manuscripts, and copper plates, holds immense cultural, historical, and linguistic value. However, deciphering these scripts manually is time-consuming and demands specialized expertise. The *Ancient Tamil Decoding* project addresses this problem by leveraging deep learning techniques to automate the recognition and translation of ancient Tamil characters into modern Tamil text.

This study proposes a novel hybrid model combining Convolutional Neural Networks (CNNs) and Long Short-Term Memory (LSTM) networks to accurately recognize characters from degraded and stylized ancient scripts. The project follows a modular methodology that includes the collection of a labeled dataset from high-resolution ancient manuscript images, preprocessing (resizing, normalization, augmentation), label encoding, and splitting of data into training and validation sets. The CNN layers extract spatial features from the character images, while the LSTM layers capture sequential dependencies for improved contextual accuracy during prediction.

Once trained using TensorFlow/Keras, the model is capable of classifying individual characters from unseen images with high accuracy. These characters are then mapped to their modern Tamil equivalents and assembled to form grammatically correct sentences. The final output is enhanced using post-processing techniques such as spacing correction and Tamil font rendering. Tools such as OpenCV, Pandas, and Google Colab were employed throughout the workflow.

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