

Image Classification using CNN

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Abstract: *This study focuses on the development and evaluation of a Convolutional Neural Network (CNN) model for the classification of images into distinct categories, specifically mountains, buildings, and glaciers. Utilizing a comprehensive dataset, we employed data preprocessing techniques such as resizing, normalization, and augmentation to ensure data consistency and enhance model robustness. The ResNet architecture was selected for its proven efficacy in deep learning tasks, and the model was trained using the Adam optimizer over 50 epochs. Our experimental results demonstrated a high accuracy of 91%, indicating the model's effectiveness in accurately categorizing diverse and complex images. The performance metrics, including precision, recall, and F1-score, were balanced across all classes, underscoring the model's reliability. This work highlights the potential of CNNs for practical applications in environmental monitoring, urban planning, and remote sensing. Future research directions include expanding the dataset, exploring advanced architectures, implementing real-time classification systems, and enhancing model interpretability and adaptability. This study provides a solid foundation for further advancements in the field of image classification using deep learning techniques.*

Keywords: Convolutional Neural Network