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Transformers in Vision: Exploring Self-Attention Mechanisms for Image Recognition Tasks

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Abstract: *The advent of transformers in natural language processing (NLP) has revolutionized the field, leading to significant advancements in tasks such as machine translation, text summarization, and sentiment analysis. Inspired by their success, researchers have begun to explore the application of transformers in computer vision, particularly for image recognition tasks. This paper delves into the self-attention mechanisms that underpin transformers and investigates their efficacy in vision-based tasks. We provide a comprehensive review of the state-of-the-art transformer models adapted for image recognition, discuss the methodologies and techniques employed, and compare their performance with traditional convolutional neural networks (CNNs). Furthermore, we explore the applications of vision transformers in various domains, including medical imaging, autonomous driving, and satellite imagery analysis. The paper concludes with a discussion on the future scope of transformers in vision, highlighting potential research directions and challenges.*

Keywords: Transformers, Self-Attention, Image Recognition, Vision Transformers, Convolutional Neural Networks, Computer Vision