Generative Architectural Design: A Deep Learning Approach for Automated Space and Infrastructure Planning

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Abstract: *Architectural design generation is a complex and time-intensive process requiring significant expertise and creativity. This research introduces a novel deep learning-based generative model that automates architectural design for rooms, buildings, plots, highways, and flyovers. The proposed model takes structured inputs such as size, area, location, and specific user prompts, including room dimensions, to produce customized architectural layouts. Leveraging a diverse dataset of architectural images and modern machine learning techniques, the model ensures adaptability and precision in design generation. This work highlights the effectiveness of integrating deep learning into architecture to streamline workflows, enhance creativity, and support urban and infrastructure planning.*

Keywords: Generative design, architectural automation, deep learning, machine learning, urban planning, infrastructure design, architectural datasets, generative modeling