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**GrowFlora: A Deep Learning Flower Generation
System for Home Gardens**

A Dissertation by

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ABSTRACT

In today's urbanized world, the demand for garden designing has surged due to the increasing urban population. The primary purpose of garden design is to enhance the beauty of the urban living environment while fostering a deeper connection between individuals and nature. When embarking on the design of a home garden with a focus on beautiful and diverse flower colors, it is essential to take several factors into consideration. Firstly, careful attention should be given to the garden's layout and the selection of appropriate flower types that align with the envisioned design. Secondly, the color scheme of the garden should harmonize with the existing colors of the home, ensuring a cohesive and visually pleasing aesthetic. Flowers exhibit an extensive array of sizes, colors, and bloom times, and making uninformed decisions about which flowers to incorporate in the garden can lead to disappointment and frustration. Without a comprehensive understanding of different flower types and their specific requirements, it can be challenging to navigate the process of garden design and make well-informed choices.

The absence of a flower generation system for Sri Lanka, providing relevant information to home garden owners before they cultivate flowers in their home gardens, leads to various challenges. Limited availability of comprehensive information about suitable flowers in Sri Lanka hinders garden owners' ability to make informed choices. The lack of local context contributes to difficulties in identifying flowers adapted to the specific climate and environmental conditions. Additionally, language barriers, limited awareness of flower varieties, and uncertainty in color preferences further exacerbate the problem. Text-to-image synthesis provides a solution to these issues by converting textual descriptions into images, which can aid in the selection of appropriate flowers for a garden.

To address this problem effectively, the author developed a GrowFlora system for Sri Lankan flowers, coupled with detailed cultivation instructions. Garden owners can input a text description of their desired flower characteristics. This system utilizes advanced generative algorithms to generate a corresponding flower image based on the provided description. By incorporating color preferences, users can visualize the potential color schemes of their home gardens, enabling them to make informed decisions about flower choices.

Keywords: Text-to-Image synthesis, Image Generative Models, Computer Vision, PyTorch