

Alapana Generation Using Finite State Machines and Generative Adversarial Networks

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The recent advancements in deep learning techniques and computational power have promoted the development of novel approaches for music generation. In this study, generating alapana, an improvisational form of Carnatic music was proposed, by leveraging Generative Adversarial Networks (GANs) and Finite State Machines (FSM). The goal is to create melodious alapana sequences that follow a given input Raga, ensuring continuity and coherence throughout the generated musical piece. The proposed approach incorporates Carnatic music theory rules into the generation process to enhance the structural coherence of the generated alapana. Additionally, various hyperparameter settings were explored to achieve the best performance. The Fréchet Audio Distance, Percentage of Correct Pitches and the Subjective evaluation through human listeners are the evaluation metrics of this approach. The result of this study demonstrates the potential of using GANs and FSM for generating continuous and pleasing alapana sequences in Carnatic music, contributing to the growing body of research in computational music generation.

Keywords: *generative adversarial network, finite state machine, carnatic music, alapana, raga*