Literature Review of Modern Motion and Dance Synthesis Techniques and Their Benefits and Flaws

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Abstract

This literature review contributes to the research towards better embodiment experience in VR technology. The results of this review will allow the research team to deploy the appropriate model for the given purpose of the experiments and observe the reactions of users to the model.

1 Introduction

TODO: write

2 Deep Learning

Machine learning and deep learning has been a popular topic in recent years. Showing incredible results for text generation, image generation and much more. Using deep learning techniques to train machine learning models could enable the generation of realistic responses to user's full body inputs in a VR or public installation setting. This can not only prompt the users to explore different movements in order to have a better embodied experience, not also prompt user interactions with the installation, or become a potent tool for co-creative purposes [3]. Different techniques and models will be reviewed and examined on their abilities to generate realistic, diverse and real-time dances for the purpose of an interactive AI agent.

Alemi et al. explored the idea of an interactive AI agent [1]. Alemi et al. compared the Factored Conditional Restricted Boltzman Machine (FCRBM) and a Long Short Term Memory (LSTM) network. And at the time, there was not a large public annotated dance dataset available like AIST++ [2], so Alemi et al. had to record their own dance data which only consisted of 4 dance performances and a total of 23 minutes of dance and audio data.

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Acknowledgements

Thanks to ...

References

[1] Omid Alemi, Jules Françoise, and Philippe Pasquier. Groovenet: Real-time music-driven dance movement generation using artificial neural networks. 4 2017.

[2] Ruilong Li, Shan Yang, David A. Ross, and Angjoo Kanazawa. Ai choreographer: Music conditioned 3d dance generation with aist++. 1 2021.

[3] Benedikte Wallace, Clarice Hilton, Kristian Nymoen, Jim Torresen, Charles Patrick Martin, and Rebecca Fiebrink. Embodying an interactive ai for dance through movement ideation. pages 454–464. Association for Computing Machinery, 2023.