A Sound Spatialization Resource Management Framework

立体音響実現のための資源管理に関するフレームワーク

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Preface

Abstract

In a virtual reality environment, users are immersed in a scene with objects which might produce sound. The responsibility of a VR environment is to present these objects, but a practical system has only limited resources, including spatialization channels (mixels), MIDI/audio channels, and processing power. A sound spatialization resource manager, introduced in this thesis, controls sound resources and optimizes fidelity (presence) under given conditions, using a priority scheme based on psychoacoustics. Objects which are spatially close together can be coalesced by a novel clustering algorithm, which considers listener localization errors. Application programmers and VR scene designers are freed from the burden of assigning mixels and predicting sound source locations. The framework includes an abstract interface for sound spatialization backends, an API for the VR environments, and multimedia authoring tools.

ヴァーチャルリアリティ環境においてユーザは音源の存在する場面に注目するので、VR環境はこれらの物体をユーザに正確に示さなければならない。しかし、現在のシステムでは空間化チャンネル(ミクセル)、MIDI/オーディオ チャンネル、処理能力を含む限られたリソースしか持っていない。この論文内で紹介される立体音響実現のための資源管理法は心理音響学による優先順位を参照することにより、与えられた状況下で音を管理し、より正確にする。空間内において互いに近くにある物体同士は、新しいクラスタリングアルゴリズム(人間の耳における情報収集の不確定さを考慮)により一つの物体とみなされる。アプリケーションプログラマやVRシーンの設計者はミクセルの割り当てや音源の場所の予想をする必要がなくなる。またそれは3次元音のバックエンドのための抽象的なインターフェイス、VR環境向けAPI、マルチメディアオーサリングツールを含む。

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Dedicated to Miho and Bianca Mone

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