

Music Identification & Audio Engine

CAPSTONE

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SOFTWARE & GAME DEVELOPMENT

Music Identification

Identify the following:

- Situation
 - E.g. Exploration, Battle, Title Screen
- Theme
 - E.g. Ice, Space, Underground

Uses machine learning

- Computer generated algorithm

Tools exist that identify a song's genre

- Never in a video game context

Audio Engine

Uses Windows Core Audio API

Implemented from the ground up

Play music files, and allow transitioning between songs

Dynamic-Link Library (DLL) in C

- Compatible with C#, Python

Demonstration

Audio Engine Technologies

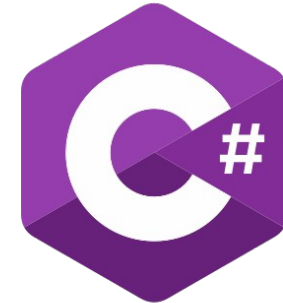
Windows API

- Windows Core Audio API

C / C++

C#

Unity



Music Identification Technologies

Accord.NET Library

- Machine Learning & Related Tools

C#

.NET / Linq

WPF



Audio Engine Challenges

Engine Rewrite

- Initial write was incompatible with Unity

C Compatibility

- To allow other languages to utilize the Audio Engine, as a DLL Library

Music Identification Challenges

Neural Network

- Attempted to implement from scratch in 2 weeks

Running out of Random Access Memory (RAM)

- Neural Network took a lot of memory

Training Problems

- Neural Network sometimes did not learn

End of Presentation
