advanced video game audio

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@VideoGameAudio
Game Audio Beginnings

• 1977 – Atari VCS / 2600
  • 1 mhz processor, 16 colours...

Combat (1977 Atari)
Combat ROM!

- 2KB ROM!
- 2 Voices

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Retro City Rampage

- Trailer video
Retro City Rampage

- In Retro City Rampage almost all sounds & music are synthesized from just pulse, triangle and noise waves.
- Mod trackers allow composer control over parameters and mix of synthesis + samples but it is also tricky to learn.
- **OpenModPlug Tracker** is free.
How to start?

- Download OpenMPT, look through the example songs and read the very detailed online help files
- Read OpenMPT Offline Help Manual (200 pages!)
- Join the forum at ChipMusic.org
- Listen to Kohina.com and other online stations
- Buy a Gameboy, buy a flash ROM cart & do LSDJ
- Download Famitracker to do NES songs
- Try out GoatTracker for Commodore 64 songs
- + many, many more ways.. :)

Kohina.com
Download the RCR Theme

- We've released the **source** to the theme music of Retro City Rampage
- It is in .it (Impulse Tracker) format which works best in OpenMPT
- Have a look through the tasty details by virt
- Stems are on SoundCloud
- **MIDI** file available too
- All good for remixing..!
Ahh the details...

- Pattern 15: 0:53-0:57 seconds into the song
- Lead guitar on Pulse1
- Second guitar on Pulse2
- Bass on Triangle
- Hi-hat & snare on Noise
- Kick, snare & toms on DPCM
- Plenty of arpeggios (J00)
- Tripplets (SD1 & SD2)
- … + plenty more details!
Chiptune Sound effects?

- We've released some RCR sound effect sources and have a whole article on how they were created on CreatingSound.com.

- Sounds are made exactly the same as the music but less “music-ish-ly”
Advanced Uses

● You can use it for adaptive music by muting tracks, changing tempo/instruments/fx/etc..

● Synchronized meta data can easily be added to songs (or sfx) to allow game to sync with specific hits in the music or to do visualizations defined by composer

● The addition of extra commands can enable behaviour changes such as randomization between patterns (branching) or even the insertion of scripting into the patterns themselves

● Can use as an open multitrack format

● Custom software synths and effects can create a more convincing songs
Indie Games -> Make your Own :)

- 2012/13 – *Retro City Rampage*
NBA Jam 2010
Vessel by Strange Loop Games

http://www.strangeloopgames.com/
Music of *Vessel*

- Video on music – Jon Hopkins soundtrack in *Vessel* - YouTube
FMOD

- Robust audio library and designer tool
- Shipped in many games since 2002
- Cross-platform: PC, 360, PS3, Vita, Mac, iOS, Wii, 3DS + more
- Good: Parameter modulation, FX, cost & speed
- Cons: Mixing, interactive music & presentation
- Overall, it's a very strong toolset and library
- FMOD Studio is now available
Lua

- Free open source scripting
- Fast, easy and efficient
- Code layer between FMOD library & C++
- Allows sound artist to make complex state aware behaviours not possible in FMOD (such as debouncing) - perfect for interactive objects
- Used extensively throughout Vessel
- Doesn't require recompilation
- Great scripting language for video games
Procedural Audio

- Generate audio in real-time based on rules & behaviours (physical modeling, modal synthesis etc.)
- Main advantage is the possibility of realism
- Drawbacks include realism, scalability, dev time & CPU time
- Can combine samples, fx & procedural audio
- Granulation is commonly used in Vessel
Granulation

- Splits sample to granules & decrease repetition with independent frequency and tempo
- Manual segmentation done in Vessel to preserve transients

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Granulation & Subtractive Synthesis

- Air is synthesized by subtractive synthesis
- Leather squeaks are granulated
Generative Music: Work in Progress
Questions?

- Trackers
- Chiptunes
- Adaptive music
- Dynamic sound design
- FMOD
- Lua
- Granulation
- Generative Music
- … ?