

# A/V Level Converter

Map Generator Tool

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# Log

**14-11-2018:**

Mild brainstorming

**17-11-2018:**

Reference Research and Concept

**19-11-2018:**

Changed the concept. Made abstractions on the idea, to enhance modularity.

**23-11-2018:**

Color scheme, Inspirations & Design Conceptualisation

Sam - Messing around with FFT transform algorithms and tutorials in unity. (2 uur)

# Research

## Fast Fourier Transform

Digital Signal Processing (DSP) Tutorial - DSP with the fast fourier transform Algorithm

[https://www.youtube.com/watch?v=HJ\\_-5mqUZ70](https://www.youtube.com/watch?v=HJ_-5mqUZ70)

## Beat Detection

[Unity Engine] Beat Detection

<https://www.youtube.com/watch?v=0i9hi9k1K10>

Tempo and Beat Tracking

<https://www.youtube.com/watch?v=FmwpkdcAXl0>

How to do FFT in Unity

<https://answers.unity.com/questions/974565/how-to-do-a-fft-in-unity.html>

Algorithmic Beat Mapping In Unity: Real-time Audio Analysis:

<https://medium.com/giant-scum/algorithmic-beat-mapping-in-unity-real-time-audio-analysis-using-the-unity-api-6e9595823ce4>

# Inspirations

## **Melody's Escape - Procedurally Generated Platformer**

Melody's Escape is a music based procedurally generated platformer which is what the tool is supposed to do. It has a handful of actions (jump, slide, attack) that are placed based on the music. There is also platform height and the balls that you pick up. Based on the title and video i would say Melody's Escape looks at a lot more info than just rhythm like pitch and volume.

### **Slayer - Angel of Death on Melody's Escape**

<https://www.youtube.com/watch?v=OhOAXXIsvfw>

## **Audiosurf 2 - Procedurally Generated Racer**

Audiosurf 2 is much simpler than Melody's Escape in many ways, it only generates notes on a three lane track. The yellow ones have to be hit and the grey ones avoided. This system is more akin to guitar hero.

### **Pantera - Death Rattle on Audiosurf 2**

<https://www.youtube.com/watch?v=VM7kQFOHI2Q>

## **TERRORHYTHM - Procedurally Generated Beat 'em Up**

TERRORHYTHM once again has a number of actions (attacks, different kinds of enemies etc.) that are done by the player based on the music. However this game has a strong focus on rhythm and the beat not being as concerned with melody so tempo and rhythm are most important here.

### **Metallica - Through The Never on TERRORHYTHM**

<https://www.youtube.com/watch?v=BKkB4vOOfWI&t=43s>

# Concept (todo)

A Multi-Tool that combines our other ways of sensory stimulation to a new form of creative output for game developers / designers.

## *A music based level generator for gaming.*

The concept is to make a tool that takes any audio file and turns it into a platformer level. We will do this mostly through Beat and Frequency Detection along with general volume. Based on this data we will generate a level which is made up of a few basic actions the player has that can differ in length such as jumps and slides.

## *A visually-based level generator for gaming.*

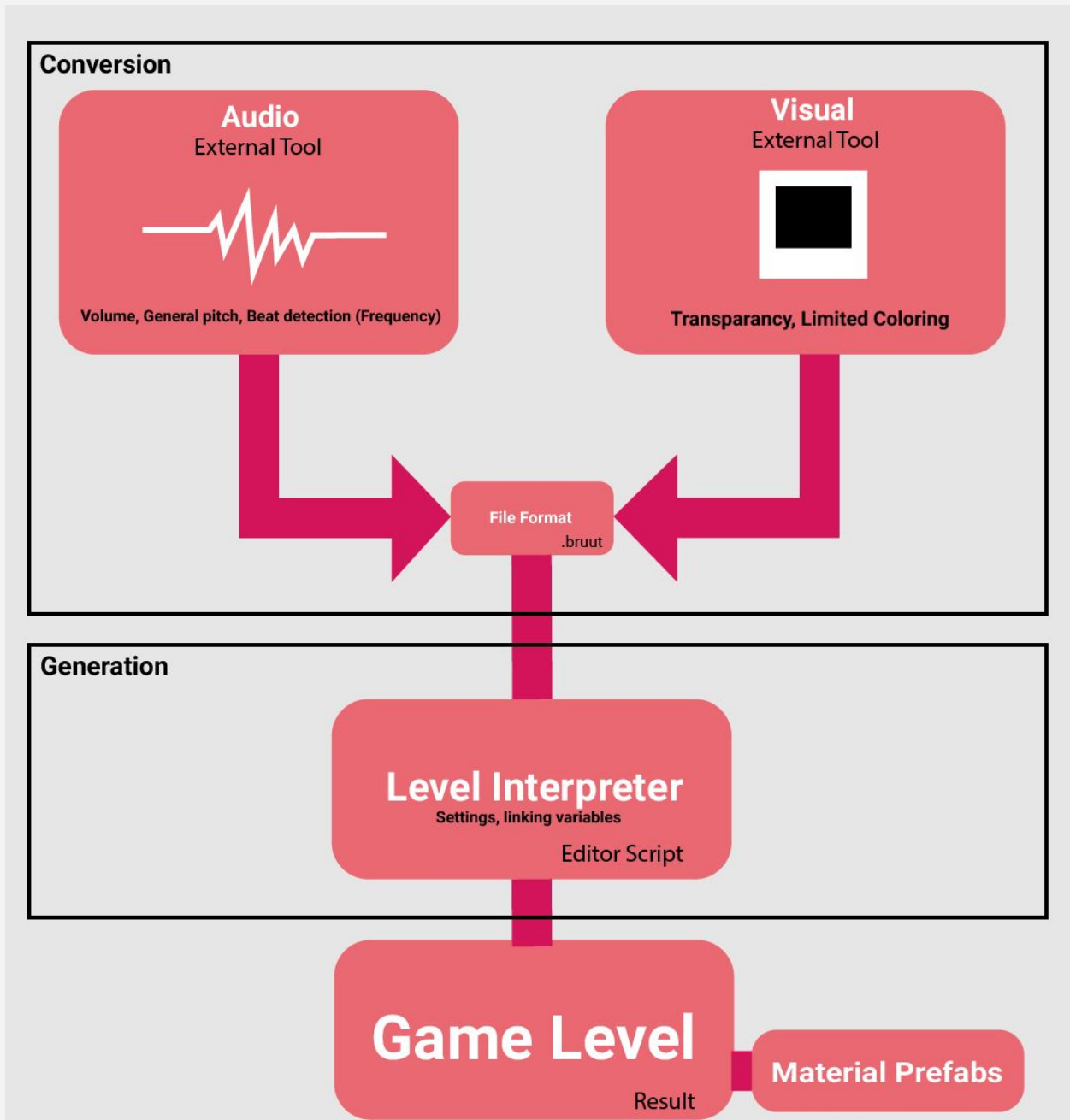
The visual side of this tool, will convert any image file into a playable game environment (in 2D). This will be achieved by scanning the colors of pixels, and encoding RGBA data into gaming-context generative functions. The user will be allowed to tweak some parameters, such as changing the gaming context to *Top-down* or *Sidescroller*. Another planned function might give the user the ability to bind certain variables of the generation functions to specific colors. This will allow the tool to be much more diverse.

After the generation, both of the generators will eventually convert and parse the encoded data into a custom .bruut file.

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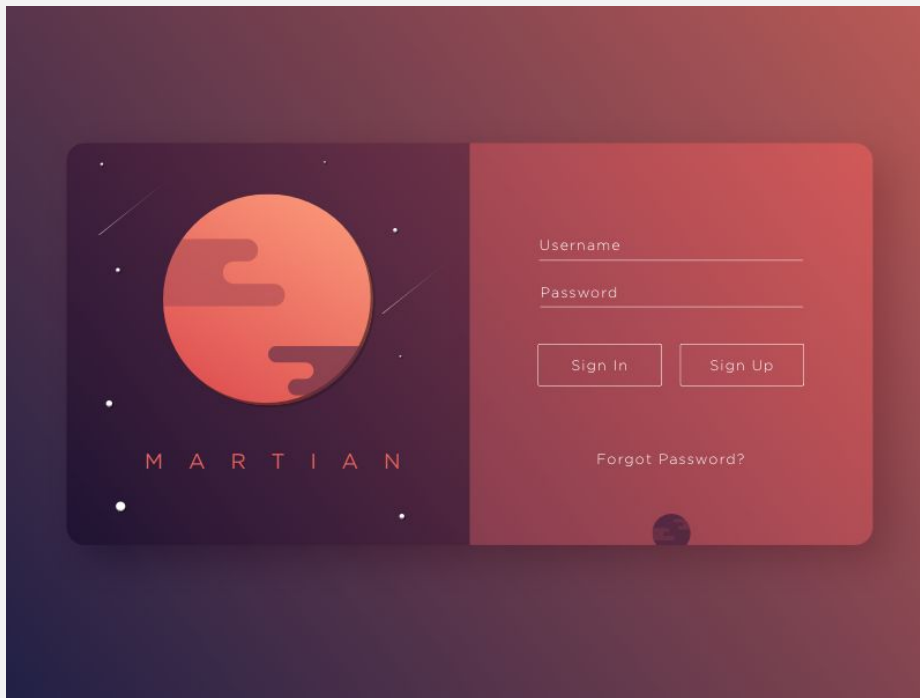
## *A level interpreter script file for Unity*

This editor script will be an easy way of applying the data of a .bruut file to the Unity engine, and will bring the gaming context to life. Simple options include the scaling of the map, perhaps the ability to divide sections of the map, and translate them into a different direction (so it adds depth to your level design) and more.



Visual chart of the linking systems of our concept.

# Design



*Inspiration for the UI design. Flat, modern & simple color scheme.*

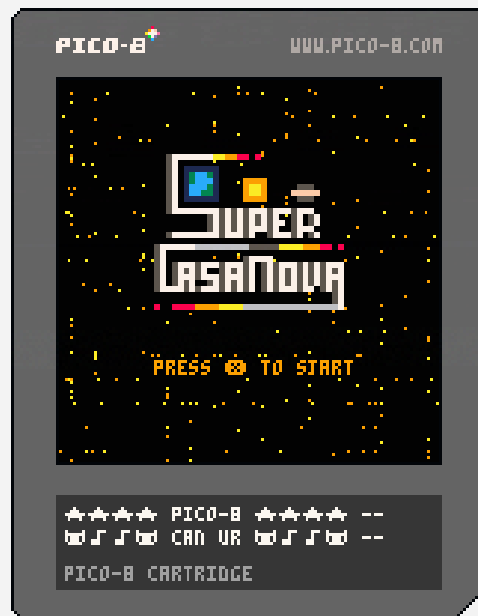


**Color scheme for the A/V Level Gen Tool.**





Second inspiration, reference material.



The Pico-8 cartridge/image system is an inspiration for the Visual part of this Tool.