1. Introduction

The process of timbre morphing involves the blending of timbres through a continuous transformation. We aim to develop a method to generate new timbres by synthesizing and manipulating existing timbres. This paper presents a new approach to timbre synthesis that uses a combination of Wigner-Ville distributions and linear interpolation to create new timbres.

Abstract

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Using the Wigner Time-Frequency Distribution

Timbre Morphing of Synthesized Transients
between the gradient at a point and the gradient value at that point. Secondly, we use a simple linear weight function for two sources. We also use the simple linear weight function for two sources.

\[
1' f'(1') s(1') N'\overline{s} I = (1') S
\]

1. Introduction and Mapping

2. The Wiener Distribution

The Wiener Distribution is the function used to calculate the probability density function of the signal in the presence of noise. The Wiener Distribution is given by the following equation:

\[
W(\theta) = \frac{1}{(2\pi)^{N/2}} \exp\left(-\frac{1}{2} \sum_{n=1}^{N} (a_n - b_n)^2\right)
\]

where \(a_n\) and \(b_n\) are the signal and noise components, respectively.

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\[
\int_{0}^{\infty} W(\theta) d\theta = 1
\]

follows.
4. Synthesis of New Signals from the Wigner Distribution

In applying the Wigner distribution transform to signals, we denote the signal's coefficients as follows:

\[
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001000 \\
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\end{pmatrix},\begin{pmatrix}
000010 \\
000001 \\
000000 \\
100000
\end{pmatrix} = d
\]

The Wigner distribution is a spreading function, which spreads the signal's frequency components over a large region. This spreading effect is depicted in the diagrams below.

Diagram 1: Wigner distribution transform applied to a signal.

Diagram 2: Resulting Wigner distribution after transformation.

Further correction of the algorithm operates on the basis of the spread of the signal's frequency components.

The Wigner distribution transform is defined as follows:

\[
\begin{align*}
\delta d &\leq |f| \leq 1 \\
\delta &\delta = |f| = 1
\end{align*}
\]

A (d, u, v) \in \mathbb{C}

These equations represent the relationship between the spread of the signal's frequency components and the transformation matrix.

In conclusion, the Wigner distribution transform is a powerful tool for analyzing and processing signals, providing insights into their frequency content and time-frequency distribution.
5. References


Figure 4. The distribution of the weights in the network. The weights are distributed according to a Gaussian distribution. The mean is 0 and the standard deviation is 1. The network has 15 layers, with 100 neurons in each layer. The output of the network is the sum of the weighted input values.

(c) (d) (e)

![Image of network diagram]

where $y$ is the decay frequency constant and $t$ the concentration in the sample. The weight distribution of the network is given by the following equation:

$$w(t) = \left(\frac{e^{-\lambda t}}{\sqrt{2\pi \sigma^2}}\right) \int_{-\infty}^{\infty} e^{-\frac{(y-x)^2}{2\sigma^2}} dx$$