CREATING AND OVERCOMING DISTANCES

First point: Distance

The terms distance and similarity are closely related from a sociological and psychological perspective. The study of various forms of exclusion and discrimination, as well as integration in diverse societies, leads to the conclusion that the conception and construction of "points of difference" and consequently the formation of groupings such as "us" and "them" is an inherent human trait. In progressive societies and communities, efforts are made to combat such "synthetic" formations of difference by introducing global similarities in interests. The investigation of such social-psychological distances has been the subject of various research studies, including those by pioneers like Emory Stephen Bogardus, whose "Bogardus Social Distance Scale" was one of the first experiments in this field. According to these studies and from a sociological perspective, "distance" can refer to various real and hypothetical criteria, including the membership of certain groups of people based on their political beliefs, social and economic status in societies, and their affiliation with ethnic classifications.

Another relevant area that provides its own definition of distance and similarity is the data-related perspective. Here, developing methods for calculating and assessing distance through data categorization is of primary importance to enable systematic comparison and evaluation of data, particularly in fields such as pattern recognition, data mining, and machine learning. Here the development of data over time plays a crucial role; the chronological scanning of continuous information (so-called time series) allows for a more accurate comparison and alignment of data sequences in the context of time, to identify potential patterns between two (possibly very different) data sequences.

From a musical perspective, and inspired by the viewpoint of data processing, I consider the various aspects of a sound event as (independent) pieces of information that are subject to developments over time. This allows me to define the relevant sonic aspects of a synthesized sound and to elaborate on their distances and similarities to the sounds of other sequences (keyword: sound sequence).

Second point: Overcoming the distance

The transition from the foreign to the familiar, from identity to alterity, represents a developmental phase of a society that shifts from being closed and exclusive to being open and inclusive. In this process, the sociologically dichotomous oppositions between the poles of worlds are discussed, the modern and its predecessors are contextualized, and their relationship is questioned. In a thematic-global context, critical thinking about distances and their overcoming is also demanded, as an (intentional or unintentional) unreflective engagement with social differences can quickly be instrumentalized for the purpose of oppression, thus becoming "distance-creating" itself, as examples from contemporary "progressive" societies illustrate. Defining a transition in this context therefore requires a rethinking of the terms distance and similarity in todays world, as the two cultural theorists Anil Bhatti and Dorothee Kimmich suggest in the introduction to their book "Ähnlichkeit. Ein kulturtheoretisches Paradigma" (Konstanz 2015, Konstanz University Press):

Similarity is a figure of the continuous, the transitional. It requires the marking of differences, but it never represents a break or opposition (p. 21/22).

To bridge the gap between two entities from a data-related perspective, it is first necessary to explore and classify the respective data before one can "effectively" measure their distance from one another. An example of a sampled time series in a one-dimensional space would be the temperature development at a specific location over a certain period. The temperature fluctuations at location A can then be compared with a second temperature development at location B or with weather developments at the same location A, sampled over the period of a second timeframe, to identify fluctuation similarities and similar or identical patterns. For calculating the distance in such a simple case, simpler distance calculations can be employed, such as the Euclidean distance metric, which can also be applied to higher dimensions of data in Euclidean space. Working out the distances between individual data points of the time series is a necessary step to establish an "efficient" transition between two data sequences. Efficient in the sense that the more similar two data points are to each other, the less effort and thus "cost" is required for a transition to occur. Such a transition of time series into one another often involves a form of interpolation between the most similar data points.

Previous research and work

Inspired by the sociocultural insights regarding the transformations of societies and driven by my fascination with musical transformations, I focus on studying and developing strategies for creating musical transitions. The aspect of time is central to my work, as structural transformations are unimaginable outside of a temporal context. Since sound events can often be reinterpreted as (arbitrarily) multidimensional entities (composed of, for example, duration, pitch, sound intensity, to name just a few of the most common dimensions), a focus of my work is also on developing a compositional tool that allows me to create musical transitions in any n-dimensional space. A synthetic sound can include further definable dimensions, such as general filter qualities, the geographical location of the sound (in the case of a multichannel composition), the shaping of intensity envelopes, and many other parameters dependent on the specific synthesis. As a basis for my applications, I use the Dynamic Time Warping (DTW) algorithm, which was developed by Japanese researchers Hiroaki Sakoe and Seibi Chiba in their work "Dynamic Programming Algorithm Optimization for Spoken Word Recognition" (IEEE Transactions on Acoustics, Speech and Signal Processing, Vol. ASSP-26, No. 1, February 1978) for the purpose of an efficient nonlinear method of speech recognition. Today, it is applied in broader fields based on time-dependent data, such as pattern and gesture recognition, medical science, sports analytics, astronomy, econometrics, robotics, epidemiology, and more. DTW allows for the alignment of data sequences of different lengths through its nonlinear approach, originally stemming from the need to compare words spoken at possibly different speeds with a reference pronunciation, minimizing temporal differences (deviations in the pace of speech). For my compositional work, I utilize a modified version of DTW, including the introduction of quantification of the interpolated data, which enables an adjustment of the final sound result according to my sonic ideas and desires. One advantage of using the purely data-driven abstract algorithm DTW is that the relevant data can be freely defined according to the desired sonic concepts, providing great flexibility in handling musical properties as abstract data.