GOAL-ORIENTED MIXING

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ABSTRACT

In the field of music production, mixing is the process that aims at converting multi-tracks to music. Automatic mixing is a field of research that aims at performing this task without human intervention. The automatic mixing community is currently focused on producing technically correct mixes. Our position is that the mixing process serves many purposes, and that technical correctness is but one of them. We call this approach *goal-oriented mixing*.

1. INTRODUCTION

The state of the art in automatic mixing provides knowledge and tools to perform a technically correct mix. This is useful, insofar as a mixing engine should be able to produce a technically correct rough mix, leaving the interesting, creative stuff for the mixer [1]. We must look beyond correctness, and one way to do so is through goal-oriented mixing. We provide a non-exhaustive list of such goals, illustrated by real-life examples. In many cases, the goal can be the expression of an emotion. The mix can therefore be linked to BRECVEMA mechanisms [2-6]. This paper refers to audio examples. To listen to the examples please go to http://csl.sony.fr/music/wimp2016.

2. GOAL: THE MIX MUST BE TRANSPARENT (EXAMPLES 1-6)

In this section, we list cases in which either the mix must not be heard as such, or most of the mixing process consists in hiding itself. This aspect of the mixing process is reminiscent of the assumption that all sources should be heard as well as possible, be it by way of equal loudness between tracks [7-9] or masking minimization [7, 10-11]. Note that an absence of mix doesn't necessarily result in a realistic or transparent mix.

3. GOAL: THE MIX MUST CONVEY A PARTICULAR FEELING (EXAMPLES 7-19)

The mixing process may highlight or create feelings that are conveyed to the listener. Several BRECVEMA mechanisms may be concerned. In a number of examples, we observe that equalization and dynamic compression may help activate the BRECVEMA mechanism "emotional contagion". In other examples, reverberations seem to activate the mechanism "visual imagery". In yet another example, volume automation appears to activate the mechanism "brain stem reflex".

4. GOAL: THE MIX MUST FOLLOW TRENDS (EXAMPLES 20-27)

Trends apply to the mix as well. Particular trends may be expressed in terms of spectrum [12] or dynamics [13]. Revivals of vintage sounds are trends - in which case the BRECVEMA mechanism "episodic memory" may be activated. If the trend is expressed in terms of spectrum, the spectral profile may be understood as a *target* in the process of target mixing as defined by [14-16].

5. GOAL: THE MIX MUST HELP CREATE ABSTRACT STRUCTURES (EXAMPLES 28-47)

The mixing process is able to create or underline a variety of abstract structures. Such structures involve: sound scenes as defined by [17]; abstract movements of a given track; space sequences involving a group of tracks [18]; auditory illusions as defined by [19]; articulations of vocals, in relation to the use of pitch-correction plug-ins [20]; and musical structure as defined by [21]. The listener's appreciation of such abstract structures may relate to the BRECVEMA mechanism "aesthetic judgment".

6. GOAL: THE MIX MUST ENHANCE / CORRECT (EXAMPLES 48-60)

Enhancements performed during the mixing process can be diverse. They include: creating punctuations; making tracks more lush; making the music more "dancy", in which case the BRECVEMA mechanism "rhythmic entertainment" may be activated; getting tracks closer to what's perceived as musical perfection, using pitch-correction plug-ins in particular.

7. GOAL: THE MIX MUST PRIORITIZE TRACKS (EXAMPLES 61-63)

The practice of track prioritization contradicts the principle that all tracks should be made as audible as possible [10-11, 22-23]. As storage price is low, musicians may postpone decisions to the last moment. As a result, the mixer receives sessions with an inordinate number of tracks. The mixer has to tone down some tracks or if possible, remove them [24]. Track prioritization can also originate from social conventions: on Céline Dion's records, the mixer is required to mix her voice significantly louder than the customary level [25].

8. CONCLUSION

There are many goals that mixing can reach beside technical correctness:

- The mix may attempt to be transparent.
- The mix may help create or convey a particular feeling.
- The mix may follow trends (current or past).
- The mix may help create abstract structures.
- The mix may enhance and correct sounds.
- The mix may prioritize tracks.

Automatic mixing currently addresses only a few of these goals. We wish that the community would investigate the technical means to reach more goals, so that automated mixing may provide more perspectives and stand a chance to emulate a human mixer.

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