T3: Why is studio production interesting?

The tutorial follows the "Why X is interesting" series that aims at bridging the gap between technology-oriented and music-related research. It will suggest a number of reasons why production is important for MIR, seen from the eyes of an expert (the first author) and a MIR researcher (the second one).

In music, the use of studio techniques has become commonplace with the advent of cheap personal computers and powerful DAWs. The MIR community has long been confronted to studio production. Since ISMIR's first installment in 2000, about 35 papers involving more than 70 authors have addressed studio production. However, more than 44% of these identify studio production as a source of problems: the so-called album or producer effect gets in the way of artist or genre identification, audio processing techniques prevent proper onset detections, or effects are responsible for false positive in singing voice detection. A few of these papers even characterize production as not being part of the music. On the other hand, another 35% of these papers either outline the knowledge of studio production as useful or indispensable to MIR tasks, or try to provide a formal characterization for this set of techniques.

A difficulty met by MIR researchers interested in studio production techniques is that production specialists are reluctant to formalize their knowledge. Like old-fashioned guild artisans, engineers and producers reputedly learn "tricks of the trade" from the "Greatest Teachers" or "mentors". As a result, knowledge of studio production techniques is not widespread in the scientific community. Even in the upcoming field of automatic mixing, a domain intrinsically related to studio production, we have found that only 15% of scientific papers take these techniques into account. A similar issue can be observed at DAFx, where papers dealing with studio production as actually performed in the music community are rare.

The tutorial aims at explaining studio production techniques to MIR researchers in a simple and practical way, in order to highlight the main production tricks and usages to a MIR audience.

We will review standard aspects of studio music production, including recording, processing, mixing, and mastering. We will then focus on the basic methods of audio processing: EQs, compression, reverbs, and such. We will illustrate how these basic techniques can be combined creatively.

Production techniques may be implemented in a variety of ways, depending on trends and available hardware. We'll go through a brief retrospective of how these techniques have been used since the mid 60's in different ways. As different variations of the same basic processes can influence, sometimes drastically, the finished product, we believe such knowledge may be useful in relation to classification and similarity.

MIR researchers often conceptualize lead vocals as a solo line, possibly ornamented with backing vocals and audio effects. In practice, we'll show that vocal track production in mainstream pop music results in complex architectures. We will analyze the vocals tracks in some mainstream hits. It will demonstrate that studio production is an integral part of the music, not an extraneous layer of effects. Consequences are obvious for the nature of the information MIR scholars look for, e.g. in information extraction, retrieval, similarity or recommendation.

We will complete the tutorial with a short demo of automatic mixing techniques developed in our lab that use auto-adaptive audio effects. It will demonstrate that consideration of production is a definite advantage in music generation.

Emmanuel Deruty studied studio production for music at the Conservatoire de Paris (CNSMDP), where he graduated as Tonmeister in 2000. He has worked in many fields related to audio and music production in Europe and in the US: sound designer in a research context (IRCAM), sound designer in a commercial context (Soundwalk collective), film music producer and composer (Autour de Minuit & Everybody on Deck, Paris), lecturer at Alchemea College of sound engineering (London), writer for the Sound on Sound magazine (Cambridge, UK). He's worked as a M.I.R. researcher at IRCAM, INRIA and Akoustic-Arts, France. He's currently working on automatic mixing at Sony CSL, and is a specialist of the "loudness war".

François Pachet received his Ph.D. and Habilitation degrees from Paris 6 University (UPMC). He is a Civil Engineer and was Assistant Professor in Artificial Intelligence and Computer Science, at Paris 6 University, until 1997. He is now director of the Sony Computer Science Laboratory in Paris, where he conducts research in interactive music listening and performance and musical metadata and developed several innovative technologies and award winning systems. François Pachet has published intensively in artificial intelligence and computer music. He was co-chair of the IJCAI 2015 special track on Artificial Intelligence and the Arts, and has been elected ECCAI Fellow in 2014. His current goal, funded by an ERC Advanced Grant, is to build computational representations of style from text and music corpora,that can be exploited for personalized content generation. He is also an accomplished musician (guitar, composition) and has published two music albums (in jazz and pop) as composer and performer.