

LEGAL ISSUES IN USING MUSICAL CONTENT FROM iTunes AND YouTube FOR MUSIC INFORMATION RETRIEVAL

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Abstract

The findings of music information retrieval research, although young a field, have a large effect in a quite diverse range of people. Nevertheless, in order to reach these findings, access and processing of copyrighted musical material is necessary. Accordingly, the music information retrieval research community actions are bound to music copyright legislation, the details of which are far from commonly known and in cases rather ambiguous. In this work, we investigate the legal implications of obtaining and processing musical content from two prominent sources of online content distribution, namely iTunes and YouTube. In addition, we explore the legitimacy of disseminating processed musical content for the purposes of establishing a commonly used fair comparison dataset for “same input - different approach” methods. All such actions are examined in the context of performing music information retrieval research.

1. Introduction

Music Information Retrieval (MIR) is comparatively a new research field with almost a decade of intense activity [Karydis et al., 2006]. Nevertheless, its results influence a variety of people ranging from music scholars to ordinary music lovers. MIR research has, so far, provided means to implement data-mining algorithms from different perspectives: by extracting valuable information from musical corpuses of some to tens of millions of songs, as well as methods to define similarity and identify such similar songs in the aforementioned corpuses [Schnitzer, 2012]. The significance and application of MIR methods affects a broad spectrum of activities ranging from the management of personal musical collections to web-based services to audio content organisation in interactive multimedia or virtual environments [Karydis et al., 2011].

One of the key requirements of MIR in order to provide for its methods is musical content access. The need for such access is twofold: (a) to analyse content and identify pertinent features the methods will rely on and (b) to test developed methodologies. The need is further intensified by the fact that music, being an artistic form of expression, does not always abide by a set of deterministic rules that researchers could rely on in order to avoid the necessity for access to content in order to draw research conclusions.

In legal terms, musical data, such as sound recordings and sheet music are the products of creative endeavour and as such are protected by copyright law. Accordingly, their reproduction, performance and distribution, to name a few, are rights that remain exclusively with their owners [Berne Convention, 1971]. It is thus obvious that the function of MIR on the musical content is subject to the application

of copyright law provisions and accordingly MIR researchers require relevant legal knowledge in order to confirm whether their research actions require the rights' owner permission so to be lawful.

Nevertheless, there exist two prominent, of many, cases where access to copyrighted musical content is widely possible. In this work, we examine the cases of iTunes [Apple Inc., 2012] & YouTube [YouTube, 2012] web-services that offer such content. Our aim is thus, the up-to-date information of MIR researchers concerning the legal implications, according to the U.K. and U.S. Copyright law, of using the musical content found therein.

The rest of the paper is organised as follows. Section 2 provides background information on music information retrieval as well as on pertinent areas of the copyright and music copyright law. Section 3 describes traditional and contemporary methodologies on obtaining musical data, while Section 4 details legal issues concerning the processing and dissemination of processed musical content for music information retrieval research. Finally the work is concluded in Section 5.

2. Background Information

In this section we present background information related music information retrieval requirements as well as an introduction to copyright law related to the theme of our work.

2.1. Music Information Retrieval Research

MIR, despite being a comparatively new field, has expanded its span of interest/activities to a great extent over the last decade. The topics covered by Music Information Retrieval Evaluation eXchange (MIREX) [MIREX, 2012] annual competition represent a widely accepted key part of the MIR breadth, including both Information Retrieval and Data mining tasks on everything music.

Despite the peculiarities and complexity of the each MIR research activity, almost all can be analysed to an abstraction level where some processes are common to all tasks. This is necessary in order to establish subtasks/actions that are to be examined according to copyright law criteria, especially when such legislation deals with only generic low-level processes.

Accordingly, we assume that one of the key generic processes taking place during most of the complex MIR research activities is partitioned to two entities, (a) the input data and (b) the induced result of a processing stage, as shown in the flow diagram of Figure 1.



Figure 1. An abstract model of an MIR process

Thus, access to musical corpuses in order to apply methods and assess results is one of the cornerstones of MIR research. Although a variety of types of musical

corpuses/data exist, in this work we are solely concerned with one of the most commonly used, the acoustic recordings of a musical performance in digitised format.

As musical data are in a format that, in most cases, is not suitable for the methodologies to act upon, another very common generic activity of the complex MIR research processes is the transformation of musical data between formats as a pre-processing step (Figure 2). Although format conversions can be of many types, in this work we are assuming a conversion wherein data are transformed to a format that does not necessary serve the same function (e.g. audition of sounds) as the original, but adheres to the requirements of the MIR methodology to be applied on. The restoration to the original format from the converted, may be (a) impossible, (b) partial, introducing distortion with respect to the original and (c) complete, leading to the exact original musical datum.

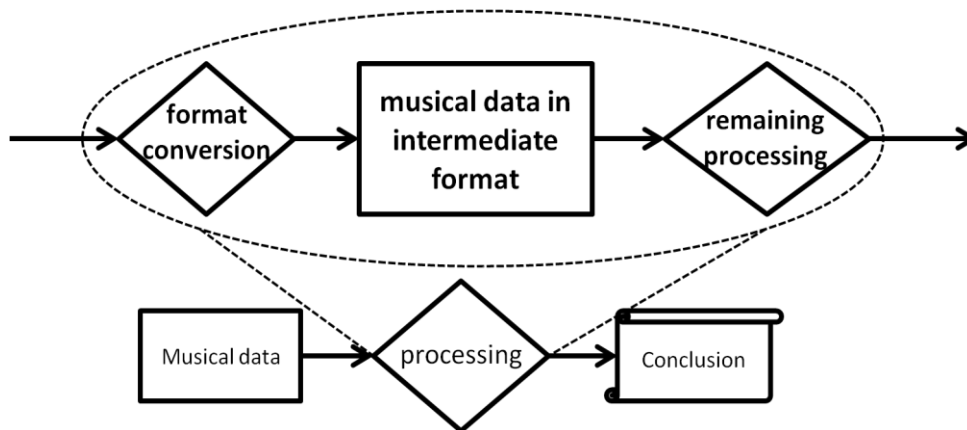


Figure 2. The analysis of the MIR processing stage in order to include a common intermediate format conversion of the musical data

Format conversion is of great interest to MIR research as it leads to an intermediate representation of a specific recording that, given different methodologies of same input type, can act as a common reference point in order to fairly assess the methodologies' conclusions. Thus, the exchange of this reference set of data between MIR researchers functions as a means to compare methods and promote research in the field.

2.2. Copyright & Music Copyright

Copyright Basics

Copyright is a property right ascertained to the author of an original work, such as a literary work or a musical work, which deprives others from engaging in certain uses of that very work, for a defined period of time, without the author's consent. Accordingly, authors are granted a bundle of rights, namely economic and moral rights where moral rights refer to the special personal link between the author and its work while economic rights are linked to the economic use of the work [Swack 1988; Dworkin 1995; Stamatoudi 1997]. In general terms, the author of the work is the first owner of the copyright in it, although there are provisions in various legislations prescribing differently (*see* U.K. Copyright law, U.S. Copyright law). It has to be stressed that copyright is not vested in ideas but only on their original way of

expression [Article 2(1), Berne Convention for the Protection of Literary and Artistic Works, 1886, Paris Act 1971].

Under the United Kingdom's (U.K.) *Copyright, Designs and Patents Act 1988* (CDPA 1988), for a work to enjoy copyright protection, it has to fall within one of the eight categories of copyrightable subject matters prescribed by the Act. If this is not the case, then copyright protection is not afforded to the creation. Moreover, the work has to be original, meaning that it has to be the result of the creator's skill, labour and judgment [Walter v. Lane AC 359 (1900); Cramp v. Smythson AC 329 (1944)] without being copied from another work [University of London Press v University Tutorial Press 2 Ch 601 (1916)]. Thus, having created an original work, the copyright owner has the right to prevent others from doing any of the restricted acts specified in the U.K. Copyright Act (Section 16, CDPA). In an effort to draw a balance between the free flow of information and the stimulus needed to induce creators in intellectual endeavors, the U.K. legislation comprises of "fair dealing" provisions allowing certain uses of a copyrighted work, without the copyright owner's authorisation, which otherwise would be deemed infringing (Chapter III, CDPA).

The United States (U.S.) Copyright Act (Copyright Act, 1976. Publ. L. No 94-553, 90 Stat. 254, codified in 17 U.S.C), requires for a creation to be an original work of authorship fixed on a tangible object in order to be protected under copyright law (Section 102, 17 U.S.C). Apparently, contrary to the U.K. law, the U.S. legislation does not have a close list of subject matters within which an original creation has to fall in order to be copyrightable. However, there has to be a more than *de minimis* expression for copyright to subsist in the work [Mary LaFrance 2008]. For instance copyright protection is not afforded to slogans or titles. Here, original is a work created independently and one reflecting a modicum of creativity [Feist Publications, Inc. v Rural Tel. Serv. Co., 499 U.S. 340, 345, (1991)]. Accordingly, the owner of the work is entitled to certain exclusive rights with regard to the use of his work (Section 106, 17 U.S.C), such as the right to reproduce the copyrighted work in copies or phonorecords and to authorise the so doing [Section 106(1), 17 U.S.C]. Likewise the "fair dealing" exceptions, the U.S. Copyright Act, under the "fair use" defence, warrants certain uses, albeit infringing, of a copyrighted work without the copyright owner's authorisation (Section 107, 17 U.S.C).

Music Copyright

With regard to music, the U.K. Copyright Act affords protection in a musical work, namely "a work consisting of music, exclusive of any words or action intended to be sung, spoken or performed with the music" [Section 3(1), CDPA]. Apparently, lyrics are protected separately by the CDPA as a literary work. As aforementioned, for copyright to subsist in a musical work, the latter need to be the outcome of the author's skill, labour and judgment while not being copied by another work. Moreover, it has to be recorded or written down, for instance in scores [Section 3(2), CDPA]. Sound recordings, being the specific recorded versions of musical compositions, are separately protected [Section 1(1)(b), CDPA]. Where the musical composition is recorded, copyright protection is afforded to the recording itself providing that this is not a mere copy of a previous one [Section 5A(2), CDPA].

The owner of a musical work and the owner of a sound recording, by virtue of the copyright law, are entitled to do or authorise others to do the following acts [Section 16(1) – (2), CDPA]: 1) copy the work, 2) issue copies of the work to the

public, 3) rent or lend copies of the works to the public, 4) perform, show or play the work in public, 5) communicate the work to the public, and only for the musical work 6) make an adaptation of the work or do any of the above in relation to an adaptation .

According to the U.S. legislation, copyright protection is provided to “musical works, including any accompanying words” [Section 102(a)(2), 17 U.S.C], meaning the music as well as the lyrics. In order to enjoy copyright protection, a musical work has to meet the requisite level of originality, namely being an independent creation and one demonstrating a spark of creativity, while it has to be recorded either on sheet music or on audible media [Section 102(a), 17 U.S.C; Mary LaFrance 2008]. The audio recording of a musical work is separately protected as a sound recording [Section 101 & 102(a)(7), 17 U.S.C]. The latter is original by virtue of the creative decisions made by the performers, sound engineers and producers while the fixation requirement is by definition fulfilled [M.W. Carroll 2003].

In particular, the owner of the musical work has the right to do or authorise others to do the following acts (Section 106, 17 U.S.C): 1) reproduce the copyrighted work in copies or phonorecords, 2) prepare derivative works based upon the copyrighted work, 3) distribute copies or phonorecords of the copyrighted work to the public by sale or other transfer of ownership, or by rental, lease, or lending, 4) perform the copyrighted work publicly and 5) display the copyrighted work publicly. As regards to sound recordings, the owner has the rights under 1, 2, 3 and 6) the right to perform the copyrighted work publicly by means of a digital audio transmission and to authorise others in so doing.

In view of the aforementioned, it is worth noticing that under both the U.K. and the U.S. legislation, a musical work and a sound recording enjoy separate copyright protection which is vested in their respective owners. Accordingly, copying a sound recording results in the copying of the underlying musical work, meaning that authorisation may be needed. Different sound recordings of the same copyrighted musical work enjoy separate copyright protection. Notwithstanding certain special provisions, under both Copyright Acts the first owner of the copyright in the musical work is the author of the composition while the producer is the owner of the copyright in the sound recording [Section 11, CDPA; Section 201, 17 U.S.C].

3. Obtaining Musical Data

As discussed in Section 2.1, musical content access is an essential requirement for MIR research. Thus, this Section details legislation issues of some up-to-date techniques of acquiring musical data, by MIR researchers, for the purposes of applying MIR research methodologies on these data.

3.1. The Traditional Way – Purchase of CDs

Purchasing a sound recording of a musical work in the form of a CD constitutes a lawful way of acquiring the copyrighted material in contrast to infringing activities such as peer – to – peer file sharing. The purchaser of a CD may engage only in uses of the work, expressly or impliedly, permitted by the terms of sale and the relevant legislation. It is common practice that the purchase of CDs is accompanied by very clear terms prohibiting any copying of the sound recording [Flint et al., 2006]. If this is the case, copying a sound recording at home constitutes an infringement of the

copyright in the recording, albeit taking legal action against such activities is not quite realistic due to their volume.

3.2. The Contemporary Way – Purchase via iTunes

Purchasing music, in digital form, via the iTunes Store constitutes nowadays one of the most popular lawful ways of obtaining musical data, such as a specific recording of a song. There is a vast variety of songs available online to the user through an easy, quick and cost effective process.

iTunes Products, such as songs and movies, are sold according to the Terms and Conditions of the iTunes Store Service. In particular, when purchasing an iTunes Product, one agrees that will use it only for personal, non – commercial activities [(i), “Usage Rules”]. Moreover, he is authorised to use it on five iTunes–authorised devices at any time [(ii), “Usage Rules”], store it on compatible devices under certain conditions [(iii), “Usage Rules”] and burn an audio playlist up to seven times [(iv), “Usage Rules”]. iTunes Products may include security technology (Digital Rights Management) limiting their use, which, purchasers are not allowed to circumvent. Products that do not contain such technology limitations, namely iTunes Plus Products, may be copied, stored and burnt on a reasonable level always for personal, non - commercial uses [(vi), “Usage Rules”].

Copyrights on the products are in no occasion conveyed to the purchaser by means of the sale and it is Apple and/or its licensors who reserve all rights. Thus, purchasing a song through iTunes Store is a lawful way of acquiring it although any further use of it is subject to the aforementioned Terms and Conditions and to copyright rules.

3.3. Using Streaming Services

The Case of YouTube

When accessing the streaming content service of YouTube, one impliedly accepts the YouTube Terms of Service, ToS [YouTube, 2012]. In order to protect copyrighted materials, such as photos or music, which are available on its site, YouTube has several provisions in its ToS indicating under what conditions one may access and use the service (for the definition of “service” *see* 1.1, ToS) and its content, where content refers mostly to copyrighted materials (for the definition of “content” *see* 1.4, ToS).

In particular, a user that uploads his original work maintains all his ownership rights in his work (7.2, ToS), while he grants to each YouTube user “a worldwide, non-exclusive, royalty-free licence to access the former’s Content through the Service, and to use, reproduce, distribute, prepare derivative works of, display and perform such Content to the extent permitted by the functionality of the Service and under these Terms” (8.1.B, ToS). At the same time, each user agrees not to “copy, reproduce, distribute, transmit, broadcast, display, sell, license, or otherwise exploit any content for any other purposes without the prior written consent of YouTube or the respective licensors of the content” (5.1.M, ToS). Moreover, where no functionality offered by YouTube exists, no distribution of any part or parts of content in any medium is permitted without YouTube’s prior written authorisation (5.1.A, ToS). Finally, the uses of content must be of personal, non – commercial nature and for streaming (5.1. L, ToS). Put simply, a YouTube user may enjoy a piece of music

that received by means of streaming transmission but may not make a copy on a computer and distribute it without YouTube's or its licensors' prior (written) consent.

When it comes to YouTube for developers, the API Service provides for highly documented computer programming methodologies in order for developers to access specific YouTube functionality and content. Thus, by using such methods, registered users may directly access full-size streaming musical video content outside the usual environment of YouTube content provision, a web-page interface. Moreover, the streaming protocol utilised by YouTube in such cases is the quite common and with publicly available documentation RTSP [IETF, 2012], increasing thus the ease of customised access to content provided.

According to the Terms of Service specifically addressed to the developers, using APIs (API ToS), any copyright in the available YouTube audiovisual content should be respected, meaning that a developer may not engage, without due permission, in acts infringing the copyright owner's exclusive rights or encourage such acts (II. 12, API ToS). For instance, a developer is not allowed to induce or create functionality for users "to store copies of YouTube audiovisual content" (II. 11, API ToS) or "to sell, lease, lend, convey, redistribute, or sublicense to any third party all or any portion of the YouTube API or API Data" (II. 4, API ToS). The commercial exploitation of any YouTube audiovisual content by means of sale is also prohibited unless YouTube's prior written approval is obtained (I. 2, API ToS).

Apparently, obtaining musical data in YouTube involves, in the context of this work, mainly the possibility for a user to enjoy listening to a sound recording of a musical composition at home while any other use, such as broadcasting this sound recording, may fall within the infringing acts prohibited by copyright law unless YouTube's or its licensors' prior (written) approval is obtained.

The Case of iTunes Affiliate API

Similarly to the YouTube API, iTunes Affiliate API offers documented programming methods in order to access content of the service. In this case, the content provided is a 30-second preview for the full-size content available at the paid service. The common file type of the data provided by the service, m4a, is designed to be easily streamed through computer networks, to arbitrary clients supporting the file format.

The main target of this service is to provide affiliates the possibility of using certain promotional content, such as previews of songs and music videos, in order to promote the content itself. Among several conditions, which apply in such case, when the "Promo Content" comprises of songs, it may only be streamed and not downloaded, saved, cached, or synchronised with video. Apparently, the "Promo Content" option goes along with specific rules of usage.

4. Legal Issues of Using Obtained Music

As described in Section 2.1, after having access to musical content, in most cases, MIR research methods include a pre-processing step that extracts information from musical data that is itself oriented towards the methodologies to be subsequently applied in order to draw a conclusion. This pre-processing conversion aims in

selecting features of the musical datum that describe a characteristic to be examined, and is thus commonly titled as “feature extraction”. Research on what features to extract has received great attention [Jensen, 2010] as their capability to correctly represent the original content is highly associated with the performance of the methodologies using them. Following the extraction of the selected features, the remaining processing, towards the conclusion, is usually done mainly on the extracted features.

In this Section we examine the legal implications of (a) the processing leading to the extracted aforementioned features as well as of (b) the dissemination of such features between MIR researchers in order to establish a fair comparison of different approaches dealing with the same problem.

4.1. Musical Processing

While obtaining musical data through lawful means is one thing, engaging in several uses of these data is another. Up to now it is clear that purchasing a song embedded on a CD or via iTunes as much as using YouTube or iTunes streaming services comes with certain terms and conditions of usage, which based on copyright law provisions, aim at protecting the copyright owners’ exclusive rights.

The aforementioned technological process of feature extraction can be viewed as a non copyright-infringing activity in light of the following considerations. Under the U.K. law, such activities executed by MIR researchers, could potentially fall within the right of the copyright owner to make an adaptation of the musical work and authorise the so doing [Sections 16(1)(e) & 16(2), CDPA], where adaptation of a musical work means “an arrangement or transcription of a work” [Section 21(3)(b), CDPA]. However, the copyright holder of a sound recording does not enjoy such a right. Such activities are unlikely to be considered as an adaptation of the copyrighted musical work or sound recording, be it embedded on a CD or an mp3, so to require the copyright owner’s authorisation. It is also unlikely to be considered as infringing of any of the other rights ascertained to the copyright owner assuming they only lead to theoretical conclusions.

Under the U.S. legislation, the copyright owner has the right to make or authorise the making of derivative works [Section 106(2), 17 U.S.C]. According to its definition, broadly construed, a derivative work is one resulting from recasting, transforming or adapting an underlying copyrighted work [Section 101, 17 U.S.C]. Unfortunately, the requisite amount of modification indicating that a copyrighted work has been “recast, transformed or adapted”, so to result in a derivative work, is under debate [Mary LaFrance 2008]. In case a derivative work is based on an underlying copyrighted work, authorisation of the copyright owner of the latter work need to be obtained. As regards to sound recordings, the adaptation right is specifically defined, meaning that the corresponding authorisation need not be attained but for the reasons of preparing a derivative work “in which the actual sounds fixed in the sound recording are rearranged, remixed, or otherwise altered in sequence or quality” [Section 114(b), 17 U.S.C]. It is not likely that feature extraction activities would be deemed to result in derivative works, therefore, no interference with the aforementioned right in the musical work and the sound recording or with any of the other rights afforded by the U.S. Copyright Act could be noticed.

The aforementioned considerations are made with regard to the relevant copyright law provisions. However, when using musical data obtained through

YouTube or iTunes, it is also the respective terms and conditions of use that should be carefully taken into account. For instance, clauses 5.1.L & 5.1.M of the YouTube ToS provide for much debate on whether MIR processes, such as feature extraction, can be deemed infringing.

4.2. Feature Content Dissemination

In this case, the degree of reversibility of the content to be disseminated is the key characteristic of the legal issues that arise following such dissemination. As described in Section 2.1, feature extraction reversibility to the original format ranges in all possibilities from impossible, to partial, to complete.

In case the applying MIR processes result in the dissemination of features without making possible any reversibility to the original format of the musical data, following the considerations of Section 4.1, conducting such activities has low likelihood of being deemed as infringing copyright law under both legislations. The same practice is already exercised in many cases, the most prominent of which is the Million Song Dataset [Bertin-Mahieux, 2011].

Where the MIR processes result in the dissemination of features which provide for the possibility of retracing the initial song, it is more likely that such activities interfere with some of the exclusive rights ascertained to the copyright owner of the musical work and the sound recording. For instance, the outcome of the process is likely to allow, due to the possibility of reversibility, the making of copies of the songs which constitutes an infringement of the reproduction right of the copyright owner of the musical work and the sound recording if there is no authorisation [Section 16(1)(a), CDPA Section 106(1), 17 U.S.C]. Therefore, prior consent from the corresponding copyright owners may be required for MIRS to engage in such activities.

5. Conclusion

In this work we investigate the legal implications of obtaining and processing musical content from two prominent sources of online content distribution, namely iTunes and YouTube. In addition, we explore the legitimacy of disseminating processed musical content for the purposes of establishing a commonly used fair comparison dataset of processed musical content. All such actions are examined for the sole purpose of advancing music information retrieval research.

It is the opinion of the authors and a common sense practice, that all music information retrieval researchers, when in doubt about the legitimacy of any activity they engage in, with regard to copyrighted materials, should bear in mind that the fundamental principle points at the need to obtain the copyright owner's authorisation.

As a final remark, it should be noted that some infringing uses of copyrighted materials, such as musical compositions and sound recordings, might be warranted, under certain conditions, within the exceptions and limitations of "fair dealing" and "fair use". However, these doctrines emerge as a defence whenever infringement has taken place where each case is examined on its own merits and no a priori justification is certain. Due to limited space, this paper focuses on the application of the primary rules of copyright law with regard to MIR researchers, leaving an open

window for future examination of the application of the aforementioned doctrines on MIR research activities.

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