

CLAIMS

1. A method for managing playback of ~~one or more~~ a plurality of items of digital media content, ~~for example~~ to ensure naturalistic transitioning between the items of digital media content, comprising the steps of:

(a) identifying a description which defines how to manage the playback of one or more of the items of digital media content, the description including descriptive metadata, wherein the metadata is generated and stored based on a digital signal processing (DSP) analysis of digital media files to automatically identify the tempo and mood of music within the digital media files, and

(b) utilising the description within a digital media player to control automatically the playback of the plurality of items of digital media content.

2. The method of Claim 1, in which the description for a specific item of digital media content includes metadata that identifies significant events or characteristics of that item and in which the digital media player then automatically uses that metadata to control the playback of that item.

3. The method of Claim 2, in which the description for a specific item of digital media content is a timeline description that identifies when in time significant events in the item occur or the location of those significant events.

4. The method of Claim 1 where the descriptive metadata about a digital media content file comprises one or more of the start point of actual content in a file; the end point of actual content in a file; the region or regions of the file which constitute vocals; the tempo of the media content; the mood of the media content; the pitch of the media content; “hooks” within the content; suitable fade in and fade out points; the positions of any choruses within the file; the locations and types of any beat points in the file; any overlay positions at which other content may be overlaid onto the digital media content during playback; and any other metadata which is relevant to controlling the playback of a digital media content file.

5. The method of any preceding claim where the descriptive metadata about a digital media content file is identified ~~by applying Digital Signal Processing (DSP) technologies to the digital content file or is identified manually or is identified~~ by a combination of both automated and manual processes.

6. The method of any preceding claim further including the step of creating a description defining how to manage playback, and that step is performed automatically or utilises a tool or tools created for that purpose or is performed manually or is performed by a combination of the listed approaches.

7. The method of any preceding claim where the description of how to manage playback includes one or more of a representation of the descriptive metadata about the digital media content, including but not limited to one or more of the start point of actual content in a file; the end point of actual content in a file; the region or regions of the file which constitute vocals; the tempo of the media content; the mood of the media content; the pitch of the media content; “hooks” within the content; suitable fade in and fade out points; the positions of any choruses within the file; the locations and types of any beat points in the file; any overlay positions at which other content may be overlaid onto the digital media content during playback; and any other metadata which is relevant to controlling the playback of a digital media content file.

8. The method of Claim 4 or of Claim 7 where the “hook” comprises one or more extracted sections of a track of audio and/or video content which are identified as (i) being representative of that track as a whole; or (ii) being the most recognisable part or parts of that track; or (iii) being the “best” parts of that track, however defined; or (iv) being related to one or more portions of another track, including but not limited to such portions of a track as are similar to portions of other tracks, such as tracks which start in a similar manner, however defined; or (v) being evocative of that track, however defined; or (vi) a combination of one or more of the listed criteria.

9. The method of any of Claims 4, 7 or 8 where the “hook” is identified using one or more of digital signal processing (“DSP”) technology, manually or by any other method.

5 10. The method of any of Claims 4, 7, 8 or 9 where the “hook” comprises one or more hooks from one or more tracks (“per-track hooks”), such individual hooks being combined to constitute a single hook by means of one or more of cross-fading, juxtaposition or any other technique to combine digital media content.

10 11. The method of any preceding claim where the description of how to manage playback includes information concerning one or more of recommendations of requirements concerning how a digital media content file may be cached on a client device; “fallback” digital media content which may be played in place of the said digital media content file should that file be unavailable for any reason; recommendations or
15 requirements as to which digital media content should be played after the said digital media content file; how to play the digital media content, in terms of which audio and/or video processing to apply, which initial volume to use for playback, how to apply normalisation of tracks or any other playback criteria; how to overlay, whether optionally or otherwise, one track onto another, such as defining commentary tracks of audio, video
20 or text for presentation alongside a currently playing track; how to manage playback, including information concerning how to control the tempo and/or pitch of digital content during playback; any other types of sound processing to employ during playback, such as one or more of effects, equalization, volume normalization, compression or any other audio and/or video processing; how to manage the presentation of the digital
25 media content to the end user in the client’s user interface; and any other metadata which is relevant to controlling the playback of a digital media content file.

12. The method of any preceding claim where the description of how to manage playback includes technical information concerning one or more of how to manage the
30 transition between two or more items of digital media content, including one or more of when to start and end the transition in the first file; when to start and end the transition “end point” in the second file; which transition effect or combination of transition

effects to utilise; the duration for which to apply any such transition effects; which interstitials, if any, to utilise when transitioning from the first digital media content to the second; and any other metadata useful to defining the transitioning between digital content files.

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13. The method of claim 12 where the transition effect comprises one or more of linear, s-curve or parametric fading, fade-to-hold, fade-to-transition, slow fade, cross fade, fast cross fade, the timing of the effect, the duration of the effect or any other information relevant to applying a given transition effect.

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14. The method of any preceding claim where automatic creation of the description is performed by a software application which generates a representation of an item of digital media content using descriptive metadata identified about that content to generate a description in some standardised format, such as XML, JSON or any other applicable
15 format.

15. The method of any preceding claim where the description defining how to manage playback describes a sequence of one or more items of digital media content, defines any effects to apply during playback and how to manage the transition between
20 each item of digital media content.

16. The method of claim 15 where the said description is created using a software application which generates the said description from a manually or automatically provided list of digital media content files or excerpts from such files such that the said
25 description generated in some standardised format, such as XML, JSON or any other applicable format.

17. The method of any preceding claim where a digital media content file itself includes a description which defines how to manage playback of one or more items of
30 digital media content.

18. The method of any preceding claim where a digital media content file includes one or more excerpts from one or more digital media files and/or more than one digital media file.

5 19. The method of any preceding claim where the description of how to manage playback of digital content is used by a digital media player to control playback of digital media content, whether directly or indirectly or by way of a plug-in to a digital media player, with the goal of avoiding unintended silence - “dead air”- and/or of producing a seamless playback experience for the end user.

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20. Method of any previous Claim, wherein the digital media content is digital music content or digital video and audio content.

15 21. Method of any previous Claim, wherein the digital media player is a smart phone or a tablet computer.

22. Method of any previous Claim, wherein the descriptive metadata includes the point of audio end, as distinct to the end of the file, in that it specifies that part of a digital media file after which there is little or no effective audio content in that file.

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23. Method of any previous Claim, wherein the descriptive metadata includes the beginning of audio elements in an audio file.

25 24. Method of any previous Claim, wherein the descriptive metadata includes one or more of, or all of: General definition; Instructions for caching; Fallback playlist; Streaming playlist, and Links for requesting more playlist items.

25. Method of any previous Claim, wherein the descriptive metadata includes information which is interpretable to define one or more of, or all of: Which track(s) to play; At which point to commence the playback of each track; At which point to end playback of each track; How to play each track, in terms of which audio and/or video
 5 processing to apply such as the initial volume to use for playback, how to apply normalisation of tracks or any other playback criteria; How to transition from and to each track, such as how to cross-fade between tracks and which interstitials (if any) to utilise to smooth that transition; Which track to play after a given track, given as a simple track identifier or as a set of selection criteria which the client application may use to
 10 choose from a selection of possible “next tracks”; How to handle the case where the “next track” is unavailable, whether temporarily or permanently, such as providing a pre-cached track to use as an alternative; How to manage the presentation of the track(s) to the end user in the client’s user interface, and How to overlay, whether optionally or otherwise, one track onto another, such as defining commentary tracks of audio, video or
 15 text for presentation alongside a currently playing track.

26. Method of any previous Claim, wherein the method further includes the step of: after opening a session/web player/software app on the digital media player, audio is played only in response to a user-instigated play action.

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27. Method of analysing digital content, comprising the steps of:

- (a) identifying a collection of a plurality of digital media files;
- (b) performing DSP analysis of the collection of digital media files to automatically generate the audio start and end points within the files, and
- 25 (c) generating and storing metadata based on the DSP analysis, and.

~~28. — Method of Claim 27,~~ further comprising the step of: performing DSP analysis of the digital media files to automatically identify the tempo and mood of music within the files.

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2928. Method of Claims ~~27 or 28~~, further comprising the step of: performing DSP analysis of the digital media files to automatically identify potential overlay points (places where audio may be overlayed onto the file), or to automatically identify “hooks”, or to automatically identify additional metadata which is automatically derivable from automated analysis of the digital media files.

3029. A collection of a plurality of digital media content files, the collection including an associated description which defines how to manage playback of one or more items of digital media content, the description including descriptive metadata, wherein the metadata is generated and stored based on a digital signal processing (DSP) analysis of digital media files to automatically identify the tempo and mood of music within the digital media files.

3130. Collection of Claim 3029, the collection including one or more interstitial files.

3231. The software application of claim 14, namely a software application which generates a description of an item of digital media content using descriptive metadata identifying features or characteristics in that content in some standardised format, such as XML, JSON or any other applicable format, and that description being used by a digital media player to control automatically the playback of digital media content.

3332. The format of the output from the software application of claim 14.

3433. The software application of claim 16.

3534. The format of the output from the software application of claim 16.

3635. A system including a digital media player and a content server, the digital media player connectable to the content server via a content delivery network, the content

server operable to provide content delivery to the digital media player in response to calls to the content server from the digital media player, wherein the system is operable to

- 5 (a) identify a description which defines how to manage the playback of one or more items of digital media content, the description including descriptive metadata, wherein the metadata is generated and stored based on a digital signal processing (DSP) analysis of digital media files to automatically identify the tempo and mood of music within the digital media files, and
- 10 (b) utilise the description within the digital media player to control automatically the playback of a plurality of items of digital media content.

3736. System of Claim 3635, wherein the digital media player is operable to identify a description which defines how to manage the playback of one or more items of digital media content, the description including descriptive metadata.

3837. System of Claim 3635, wherein the content server is operable to identify a description which defines how to manage the playback of one or more items of digital media content, the description including descriptive metadata, and to transmit the description to the digital media player.

3938. A system including a digital media player, an identification server and a content server, the digital media player, the identification server and the content server connectable to each other via a content delivery network, the content server operable to provide content delivery to the digital media player in response to calls to the content server from the digital media player, wherein

- (a) the identification server is operable to identify a description which defines how to manage the playback of one or more items of digital media content, the description including descriptive metadata, wherein the metadata is generated and stored based on a digital signal processing (DSP) analysis of digital media files to automatically identify the tempo and mood of music within the digital media files,

(b) the identification server is operable to transmit the description to the digital media player, and

(c) the digital media player is operable to utilise the description to control automatically the playback of a plurality of items of digital media content.

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4039. System of any of Claims 36-35 to 3938, wherein the system is operable to implement any of the methods of Claims 1 to 2928.

4440. A digital media player forming part of a system of any of Claims 36-35 to 4039.

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4241. A content server forming part of a system of any of Claims 36-35 to 4039.

4342. An identification server forming part of a system of Claim 3938.

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4443. Computer program product operable to perform a method of managing playback of ~~one or more~~ a plurality of items of digital media content, ~~for example~~ to ensure naturalistic transitioning between items of digital media content, the computer program product operable to perform the steps of:

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(a) identifying a description which defines how to manage the playback of one or more items of digital media content, the description including descriptive metadata, wherein the metadata is generated and stored based on a digital signal processing (DSP) analysis of digital media files to automatically identify the tempo and mood of music within the digital media files, and

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(b) utilising the description within a digital media player to control automatically the playback of the plurality of items of digital media content.

4544. Computer program product of Claim 4443, operable to implement any of the methods of Claims 1 to 2928.