

WHAT IS CLAIMED IS:

- 1 1. A method of processing video data, the method comprising:
2 obtaining a plurality of frames of video data;
3 determining at least one frame of the plurality of frames being corrupted;
4 generating an indication of corruption of the at least one frame; and
5 generating a media file including the indication.
- 1 2. The method of claim 1, wherein the video data includes first data
2 corresponding to the at least one frame of the plurality of frames, and wherein the first data is
3 insufficient for decoding the at least one frame properly.
- 1 3. The method of claim 1, wherein the at least one frame is part of an
2 inter-frame prediction chain, wherein the video data includes first data corresponding to the
3 inter-frame predication chain, and wherein the first data is insufficient for decoding the at
4 least one frame properly.
- 1 4. The method of claim 1, wherein the video data includes a plurality of
2 video samples, each of the plurality of video samples including one or more frames of the
3 plurality of frames, wherein the plurality of video samples includes a first video sample that
4 includes the corrupted at least one frame, the first video sample being associated with a type
5 identifier that identifies a type of content included in the first video sample, and wherein the
6 indication includes the type identifier.
- 1 5. The method of claim 4, wherein the type identifier indicates that the
2 first video sample includes the at least one of the corrupted frames.
- 1 6. The method of claim 4, wherein the type identifier indicates a media
2 type and a type of decoder used to process the media file.
- 1 7. The method of claim 6, wherein the type identifier includes a sample
2 entry type.
- 1 8. The method of claim 1, wherein the media file is based on an
2 International Standards Organization (ISO) base media file format (ISOBMFF).

1 9. The method of claim 1, wherein the media file includes a list
2 representation of a plurality of segments of the video data, the plurality of segments including
3 a first segment and a second segment wherein each of first segment and second segment
4 includes one or more frames of the plurality of frames, the second segment further including
5 one or more missing frames of the plurality of frames, wherein the indication is a first
6 indication, and wherein the method further comprises:

7 determining that the second segment includes the one or more missing frames;
8 generating a second indication of the one or more missing frames; and
9 including the second indication in the media file.

1 10. The method of claim 9, wherein the media file is based on a media
2 presentation description (MPD) format, wherein the list representation includes one or more
3 adaption sets, each of the one or more adaption sets including at least one or more of one or
4 more representations or one or more sub-representations comprising the one or more missing
5 frames, wherein each of the one or more representations or the one or more sub-
6 representations are associated with one or more segments, and wherein the second indication
7 includes one or more elements associated with the one or more missing frames included in
8 the one or more representations or the one or more sub-representations, the one or more
9 elements being associated with a set of attributes including a timestamp and a duration of the
10 second segment.

1 11. The method of claim 9, wherein the list representation includes
2 information for retrieving the first segment but not the second segment, and wherein the
3 second indication comprises an omission of information for retrieving the second segment.

1 12. The method of claim 9, wherein the list representation includes a text
2 indicator associated with the second segment, the text indicator indicating that the second
3 segment includes the one or more missing frames, and wherein the second indication includes
4 the text indicator.

1 13. The method of claim 12, wherein the media file is based on a HTTP
2 Live Streaming (HLS) playlist format, wherein each segment of the plurality of segments is
3 associated with a Transport Stream (TS) file, wherein the list representation includes a set of
4 tags, and wherein the text indicator is a tag of the set of tags associated with the second
5 segment.

1 14. The method of claim 12, wherein the media file is based on a common
2 media application format (CMAF) and includes a playlist, wherein each segment of the
3 plurality of segments is associated with an ISOBMFF, wherein the list representation
4 includes a set of tags, and wherein the text indicator is a tag of the set of tags associated with
5 the second segment.

1 15. A method of processing a media file, the method comprising:
2 obtaining a media file including media content, the media content including a
3 plurality of frames of video data;
4 determining, based on an indication in the media file, the plurality of frames
5 include at least one corrupted frame; and
6 processing the at least one corrupted frame based on the indication.

1 16. The method of claim 15, wherein the video data includes first data
2 corresponding to the at least one frame of the plurality of frames, and wherein the first data is
3 insufficient for decoding the at least one frame properly.

1 17. The method of claim 15, wherein the at least one frame is part of an
2 inter-frame prediction chain, wherein the video data includes first data corresponding to the
3 inter-frame predication chain, and wherein the first data is insufficient for decoding the at
4 least one frame properly.

1 18. The method of claim 15, wherein the media content include a plurality
2 of video samples, each of the plurality of video samples including one or more frames of the
3 plurality of frames, wherein the plurality of video samples includes a first video sample that
4 includes the corrupted at least one frame, the first video sample being associated with a type
5 identifier that identifies a type of content included in the first video sample, and wherein the
6 indication includes the type identifier.

1 19. The method of claim 18, wherein the type identifier indicates that the
2 video sample includes the at least one of the corrupted frames.

1 20. The method of claim 18, wherein the type identifier indicates a media
2 type and a type of decoder used to process the media file.

1 21. The method of claim 20, wherein the type identifier includes a sample
2 entry type.

1 22. The method of claim 15, wherein the media file is based on an
2 International Standards Organization (ISO) base media file format (ISOBMFF).

1 23. The method of claim 15, wherein the processing the at least one
2 corrupted frame based on the indication comprises:

3 identifying, based on the indication, a portion of the media content
4 corresponding to the corrupted at least one frame; and
5 skipping processing of the portion of the media content.

1 24. The method of claim 15, wherein the media file includes a list
2 representation of a plurality of segments of the video data, the plurality of segments including
3 a first segment and a second segment, each of first segment and second segment including
4 one or more frames of the plurality of frames, wherein the second segment further includes
5 one or more missing frames of the plurality of frames, wherein the indication is a first
6 indication, and wherein the media file further includes a second indication to indicate that the
7 second segment includes the one or more missing frames of the plurality of frame.

1 25. The method of claim 24, wherein the media file is based on a media
2 presentation description (MPD) format, wherein the list representation includes one or more
3 adaption sets, each of the one or more adaption sets including at least one or more of one or
4 more representations or one or more sub-representations comprising the one or more missing
5 frames, wherein each of the one or more representations or the one or more sub-
6 representations are associated with one or more segments, and wherein the second indication
7 includes one or more elements associated with the one or more missing frames included in
8 the one or more representations or the sub-presentations associated with the second segment,
9 the one or more elements being associated with a set of attributes including a timestamp and a
10 duration of the second segment.

1 26. The method of claim 24, wherein the list representation includes
2 information for retrieving the first segment but not the second segment, and wherein the
3 second indication comprises omission of information for retrieving the second segment.

1 27. The method of claim 24, wherein the list representation includes a text
2 indicator associated with the second segment, the text indicator indicating that the second
3 segment includes the one or more missing frames, and wherein the second indication includes
4 the text indicator.

1 28. The method of claim 27, wherein the media file is based on a HTTP
2 Live Streaming (HLS) playlist format, wherein each segment of the plurality of segments is
3 associated with a Transport Stream (TS) file, wherein the list representation includes a set of
4 tags, and wherein the text indicator is a tag of the set of tags associated with the second
5 segment.

1 29. The method of claim 27, wherein the media file is based on a common
2 media application format (CMAF) and includes a playlist, wherein each segment of the
3 plurality of segments is associated with ISOBMFF, wherein the list representation includes a
4 set of tags, and wherein the text indicator is a tag of the set of tags associated with the second
5 segment.

1 30. The method of claim 24, wherein the processing the at least one
2 corrupted frame based on the indication comprises:
3 transmitting a request to a stream server to request a third segment in place of
4 the second segment.

1 31. An apparatus for processing video data, comprising:
2 a memory configured to store the video data; and
3 a processor configured to:
4 obtain a plurality of frames of the video data;
5 determine at least one frame of the plurality of frames being corrupted;
6 generate an indication of corruption of the at least one frame; and
7 generate a media file including the indication.

8 32. The apparatus of claim 31, wherein the video data includes first data
9 corresponding to the at least one frame of the plurality of frames, and wherein the first data is
10 insufficient for decoding the at least one frame properly.

1 33. The apparatus of claim 31, wherein the at least one frame is part of an
2 inter-frame prediction chain, wherein the video data includes first data corresponding to the

3 inter-frame predication chain, and wherein the first data is insufficient for decoding the at
4 least one frame properly.

1 34. The apparatus of claim 31, wherein the video data includes a plurality
2 of video samples, each of the plurality of video samples including one or more frames of the
3 plurality of frames, wherein the plurality of video samples includes a first video sample that
4 includes the corrupted at least one frame, the first video sample being associated with a type
5 identifier that identifies a type of content included in the first video sample, and wherein the
6 indication includes the type identifier.

1 35. The apparatus of claim 34, wherein the type identifier indicates that the
2 first video sample includes the at least one of the corrupted frames.

1 36. The apparatus of claim 34, wherein the type identifier indicates a
2 media type and a type of decoder used to process the media file.

1 37. The apparatus of claim 36, wherein the type identifier includes a
2 sample entry type.

1 38. The apparatus of claim 31, wherein the media file is based on an
2 International Standards Organization (ISO) base media file format (ISOBMFF).

1 39. The apparatus of claim 31, wherein the media file includes a list
2 representation of a plurality of segments of the video data, the plurality of segments including
3 a first segment and a second segment wherein each of first segment and second segment
4 includes one or more frames of the plurality of frames, the second segment further including
5 one or more missing frames of the plurality of frames, wherein the indication is a first
6 indication, and wherein the processor is further configured to:

7 determine that the second segment includes the one or more missing frames;
8 generate a second indication of the one or more missing frames; and
9 include the second indication in the media file.

1 40. The apparatus of claim 39, wherein the media file is based on a media
2 presentation description (MPD) format, wherein the list representation includes one or more
3 adaption sets, each of the one or more adaption sets including at least one or more of one or
4 more representations or one or more sub-representations comprising the one or more missing

5 frames, wherein each of the one or more representations or the one or more sub-
6 representations are associated with one or more segments, and wherein the second indication
7 includes one or more elements associated with the one or more missing frames included in
8 the one or more representations or the one or more sub-representations, the one or more
9 elements being associated with a set of attributes including a timestamp and a duration of the
10 second segment.

1 41. The apparatus of claim 39, wherein the list representation includes
2 information for retrieving the first segment but not the second segment, and wherein the
3 second indication comprises an omission of information for retrieving the second segment.

1 42. The apparatus of claim 39, wherein the list representation includes a
2 text indicator associated with the second segment, the text indicator indicating that the second
3 segment includes the one or more missing frames, and wherein the second indication includes
4 the text indicator.

1 43. The apparatus of claim 42, wherein the media file is based on a HTTP
2 Live Streaming (HLS) playlist format, wherein each segment of the plurality of segments is
3 associated with a Transport Stream (TS) file, wherein the list representation includes a set of
4 tags, and wherein the text indicator is a tag of the set of tags associated with the second
5 segment.

1 44. The apparatus of claim 42, wherein the media file is based on a
2 common media application format (CMAF) and includes a playlist, wherein each segment of
3 the plurality of segments is associated with an ISOBMFF, wherein the list representation
4 includes a set of tags, and wherein the text indicator is a tag of the set of tags associated with
5 the second segment.

6
7 45. The apparatus of claim 31, wherein the apparatus comprises a mobile
8 device with a camera for capturing pictures.

1 46. An apparatus for processing a media file, comprising:
2 a memory configured to store the media file; and
3 a processor configured to:

4 obtain a media file including media content, the media content
5 including a plurality of frames of video data;
6 determine, based on an indication in the media file, the plurality of
7 frames include at least one corrupted frame; and
8 process the at least one corrupted frame based on the indication.

1 47. The apparatus of claim 46, wherein the video data includes first data
2 corresponding to the at least one frame of the plurality of frames, and wherein the first data is
3 insufficient for decoding the at least one frame properly.

1 48. The apparatus of claim 46, wherein the at least one frame is part of an
2 inter-frame prediction chain, wherein the video data includes first data corresponding to the
3 inter-frame predication chain, and wherein the first data is insufficient for decoding the at
4 least one frame properly.

1 49. The apparatus of claim 46, wherein the media content include a
2 plurality of video samples, each of the plurality of video samples including one or more
3 frames of the plurality of frames, wherein the plurality of video samples includes a first video
4 sample that includes the corrupted at least one frame, the first video sample being associated
5 with a type identifier that identifies a type of content included in the first video sample, and
6 wherein the indication includes the type identifier.

1 50. The apparatus of claim 49, wherein the type identifier indicates that the
2 video sample includes the at least one of the corrupted frames.

1 51. The apparatus of claim 49, wherein the type identifier indicates a
2 media type and a type of decoder used to process the media file.

1 52. The apparatus of claim 51, wherein the type identifier includes a
2 sample entry type.

1 53. The apparatus of claim 46, wherein the media file is based on an
2 International Standards Organization (ISO) base media file format (ISOBMFF).

1 54. The apparatus of claim 46, wherein the processor is further configured
2 to:

3 identify, based on the indication, a portion of the media content corresponding
4 to the corrupted at least one frame; and
5 skip processing of the portion of the media content.

1 55. The apparatus of claim 46, wherein the media file includes a list
2 representation of a plurality of segments of the video data, the plurality of segments including
3 a first segment and a second segment, each of first segment and second segment including
4 one or more frames of the plurality of frames, wherein the second segment further includes
5 one or more missing frames of the plurality of frames, wherein the indication is a first
6 indication, and wherein the media file further includes a second indication to indicate that the
7 second segment includes the one or more missing frames of the plurality of frame.

1 56. The apparatus of claim 55, wherein the media file is based on a media
2 presentation description (MPD) format, wherein the list representation includes one or more
3 adaption sets, each of the one or more adaption sets including at least one or more of one or
4 more representations or one or more sub-representations comprising the one or more missing
5 frames, wherein each of the one or more representations or the one or more sub-
6 representations are associated with one or more segments, and wherein the second indication
7 includes one or more elements associated with the one or more missing frames included in
8 the one or more representations or the sub-presentations associated with the second segment,
9 the one or more elements being associated with a set of attributes including a timestamp and a
10 duration of the second segment.

1 57. The apparatus of claim 55, wherein the list representation includes
2 information for retrieving the first segment but not the second segment, and wherein the
3 second indication comprises omission of information for retrieving the second segment.

1 58. The apparatus of claim 55, wherein the list representation includes a
2 text indicator associated with the second segment, the text indicator indicating that the second
3 segment includes the one or more missing frames, and wherein the second indication includes
4 the text indicator.

1 59. The apparatus of claim 58, wherein the media file is based on a HTTP
2 Live Streaming (HLS) playlist format, wherein each segment of the plurality of segments is
3 associated with a Transport Stream (TS) file, wherein the list representation includes a set of

4 tags, and wherein the text indicator is a tag of the set of tags associated with the second
5 segment.

1 60. The apparatus of claim 58, wherein the media file is based on CMAF
2 (common media application format) and includes a playlist, wherein each segment of the
3 plurality of segments is associated with ISOBMFF, wherein the list representation includes a
4 set of tags, and wherein the text indicator is a tag of the set of tags associated with the second
5 segment.

1 61. The apparatus of claim 55, wherein the processor is further configured
2 to:
3 transmit a request to a stream server to request a third segment in place of the
4 second segment.

5 62. The apparatus of claim 46, further comprising:
6 a display for displaying one or more of the plurality of frames of video data.

7
8 63. The apparatus of claim 46, wherein the apparatus comprises a mobile
9 device with a camera for capturing pictures.

10

1 64. An apparatus for processing video data, comprising:
2 means for obtaining a plurality of frames of video data;
3 means for determining at least one frame of the plurality of frames being
4 corrupted;
5 means for generating an indication of corruption of the at least one frame; and
6 means for generating a media file including the indication.

1 65. An apparatus for processing a media file, comprising:
2 means for obtaining a media file including media content, the media content
3 including a plurality of frames of video data;
4 means for determining, based on an indication in the media file, the plurality
5 of frames including at least one corrupted frame; and
6 means for processing the at least one corrupted frame based on the indication.

1 66. A non-transitory computer-readable medium having stored thereon
2 instructions that, when executed by one or more processors, causes the one or more
3 processors to:

4 obtain a plurality of frames of video data;
5 determine at least one frame of the plurality of frames being corrupted;
6 generate an indication of corruption of the at least one frame; and
7 generate a media file including the indication.

1 67. A non-transitory computer-readable medium having stored thereon
2 instructions that, when executed by one or more processors, cause the one or more processors
3 to:

4 obtain a media file including media content, the media content including a
5 plurality of frames of video data;
6 determine, based on an indication in the media file, the plurality of frames
7 including at least one corrupted frame; and
8 process the at least one corrupted frame based on the indication.