CLAIMS

1. A method of rendering audio to enable split rendering with pose correction around multiple rotational axes, the method comprising:

obtaining an immersive audio content (A);

obtaining a reference pose (P');

rendering the immersive audio content (A) into a first number of binaural pre-renditions (Bin_n), wherein the binaural pre-renditions (Bin_n) correspond to a set of probing poses (P_n) associated with the reference pose (P'), wherein the set of probing poses (P_n) include poses equal to the reference pose (P') and/or poses that deviate from the reference pose (P') by rotation about at least one of the rotational axes;

calculating a second number of approximate binaural representations (Bin'_m) based on the binaural pre-renditions (Bin_n), wherein the approximate binaural representations (Bin'_m) correspond to a set of virtual probing poses (P_m), wherein the virtual probing poses (P_m) deviate from the probing poses (P_n) by rotation around at least one of the rotational axes;

determining a reference binaural representation (Bin_{ref}) based on one or more of the binaural pre-renditions (Bin_n) and the approximate binaural representations (Bin'_m);

computing reconstruction metadata ($\boldsymbol{M}$) to enable reconstruction of the binaural pre-renditions (Bin_n) and the approximate binaural representations (Bin'_m) from the reference binaural representation (Bin_{ref});

encoding the reconstruction metadata ($\boldsymbol{M}$) and the reference binaural representation (Bin_{ref}) in an output bitstream (b_2); and

outputting the output bitstream (b_2).

2. The method according to claim 1, wherein the approximate binaural representations (Bin'_m) are calculated by interpolating the binaural pre-renditions (Bin_n).

3. The method according to claim 1 or 2, wherein at least one of the approximate binaural representations (Bin'_m) is computed by modifying the reconstruction metadata, and applying the modified reconstruction metadata to one of the binaural pre-renditions.

4. The method according to any one of the preceding claims, wherein the reference binaural representation (Bin_{ref}) is selected from the binaural pre-renditions (Bin_n) and the approximate binaural representations (Bin'_m).

5. The method according to any one of claims 1-3, wherein the reference binaural representation (Bin_{ref}) corresponds to the reference pose (P') and is obtained by linearly combining the binaural pre-renditions.

6. The method according to any one of claims 1-3, wherein the reference binaural representation (Bin_{ref}) corresponds to the reference pose (P') and is obtained by binaural rendering of the immersive audio content (A).

7. The method according to any one of the preceding claims, wherein the step of computing reconstruction metadata includes:

for each rotational axis:

selecting a first set of representations from the binaural pre-renditions (Bin_n) and the approximate binaural representations (Bin'_m), the first set of representations corresponding to probing poses deviating from each other by rotation around the rotational axis, and

computing axis-specific reconstruction metadata (***M, H***) which enables reconstruction of at least one representations in the set from another representation in the set, wherein the axis-specific reconstruction metadata (***M, H***) represents a deviation around the rotational axis.

8. The method according to claim 1, wherein at least one of the axis-specific reconstruction metadata (***M***, ***H***) is computed before all approximate binaural representations (Bin'_m) are calculated, and wherein at least one of the approximate binaural representations (Bin'_m) is calculated by applying the axis-specific reconstruction metadata to one of the binaural pre-renditions.

9. The method according to any one of the preceding claims, wherein the first number is D+1 and the second number is D-1, where D is the number of rotational axes.

10. The method according to claim 9, wherein D=2, and wherein:

a first probing pose (P_1) deviates from the reference pose (P') by a first angle ($-\alpha$) around a first axis and by a second angle ($-\beta$) around a second axis,

a second probing pose (P_2) deviates from the reference pose (P') by the first angle ($-\alpha$) around the first axis and by a third angle ($+\beta$) around the second axis,

a third probing pose (P_3) deviates from the reference pose (P') by a fourth angle ($+\alpha$) around the first axis and is equal to the reference pose (P') around the second axis,

a first virtual probing pose (P_4) deviates from the reference pose (P') by the first able ($-\alpha$) around the first axis and is equal to the reference pose (P') around the second axis.

11. The method according to claim 10, wherein the fourth value ($+\alpha$) is the negative of the first value (-α), and wherein the third value ($+\beta$) is the negative of the second value ($-\beta$).

12. The method according to claim 9, wherein D=3, and wherein:

a first probing pose (P_1) deviates from the reference pose (P') by a first angle ($-\alpha$) around a first axis, by a second angle ($-\beta$) around a second axis, and by a third angle ($-\gamma$) around a third axis,

a second probing pose (P_2) deviates from the reference pose (P') by the first angle ($-\alpha$) around the first axis, by the second angle ($-\beta$) around the second axis, and by a fourth angle ($+\gamma$) around the third axis,

a third probing pose (P_3) deviates from the reference pose (P') by the first angle ($-\alpha$) around the first axis, by a fifth angle ($+\beta$) around the second axis, and is equal to the reference pose (P') around the third axis,

a fourth probing pose (P_4) deviates from the reference pose (P') by the sixth angle ($+\alpha$) around the first axis, and is equal to the reference pose (P') around the second and third degrees of freedom,

a first virtual probing pose (P_5) deviates from the reference pose (P') by the first angle ($-\alpha$) around the first axis, by the second angle ($-\beta$) around the second axis, and is equal to the reference pose (P') around the third axis, and

a second virtual probing pose (P_6) deviates from the reference pose (P') by the first angle ($-\alpha$) around the first axis, and is equal to the reference pose (P') around the second and third degrees of freedom.

13. The method according to claim 12, wherein the sixth angle ($+\alpha$) is the negative of the first angle ($-\alpha$), wherein the fifth angle ($+\beta$) is the negative of the second angle ($-\beta$), and wherein the fourth angle ($+\gamma$) is the negative of the third angle ($-\gamma$).

14. The method according to one of claims 10-13, wherein the first axis is the yaw axis, the second axis is the pitch axis and the third axis is the roll axis.

15. The method according to one of the preceding claims, wherein the reference pose (P') is based on user head pose information obtained from a user-held device.

16. The method according to claim 15, wherein pose information indicative of the reference pose (P') is encoded and included in the output bitstream (b_2).

17. The method according to one of the preceding claims, wherein pose information indicative of the probing poses (P_n) and virtual probing poses (P_m) is encoded and included in the output bitstream (b_2).

18. The method according to any one of the preceding claims, wherein the reconstruction metadata (***M***) includes, for each time-frequency tile, a two-by-two matrix.

19. The method according to claim 18, further comprising quantizing and encoding the reconstruction metadata (***M***) based on symmetries in reconstruction metadata.

20. The method according to claim 18, further comprising encoding the reconstruction metadata (***M***) using differential coding between metadata relating to different probing poses.

21. An apparatus comprising a processor and a memory coupled to the processor, wherein the processor is adapted to cause the apparatus to carry out the method according to any one of claims 1-20.

22. A computer-readable storage medium storing a program comprising instructions that, when executed by a processor, cause the processor to carry out the method according to any one of claims 1-20.