CLAIMS

1. A method for correcting position estimates of a movable object comprising:
establishing (1001) a hidden Markov model, HMM, instance for a movable object; and
for positioning times of a sequence of positioning times,
receiving (1002) a position estimate from a positioning device of the movable object for a respective positioning time,
determining (1003) a set of candidate path segments for the positioning time by identifying orphaned candidates from sets of previous candidate path segments and removing the orphaned candidates, wherein the orphaned candidates are candidates which are unreachable from any candidates at a previous positioning time directly preceding the positioning time;
determining (1004) likelihoods for the candidate path segments to correspond to the position estimate by application of the Viterbi algorithm to the hidden Markov model instance, wherein the application of the Viterbi algorithm to the HMM instance comprises determining transition probabilities between the candidate path segments of a last positioning time added to the HMM instance and the candidate path segments of the positioning time based on calculation of shortest routing distance between the candidate path segments and a distance threshold determined by speed limits of the candidate path segments;
expanding (1005) the HMM instance by the determined likelihoods for the candidate path segments for the positioning time; and
determining (1006) a corrected position estimate from a candidate path segment of the set of candidate path segments with the highest likelihood.

2. The method of claim 1, further comprising transmitting the corrected position estimate to the positioning device.

3. The method of claim 1 or 2, wherein expanding (1005) the HMM instance comprises adding the positioning time with the set of candidate path segments as possible values for the positioning time to the HMM and associating the candidate path segments with the determined likelihoods.

4. The method of any one of claims 1 to 3, wherein the application of the Viterbi algorithm to the HMM instance comprises an incremental application of the Viterbi algorithm from the positioning time in the sequence of positioning times preceding the positioning time to the positioning time.

5. The method of any one of claims 1 to 4, wherein the application of the Viterbi algorithm to the HMM instance comprises determining, for each candidate path segments of the set of candidate path segments, an emission probability that the candidate path segment produces the position estimate, and determining the likelihoods from the emission probabilities, the transition probabilities and the likelihoods of the candidate path segments of the last positioning time added to the HMM instance according to the Viterbi algorithm.

6. The method of any one of claims 1 to 5, comprising retrieving the HMM instance for the movable object from a database and storing the expanded HMM instance in the database.

7. The method of any one of claims 1 to 6, comprising receiving, for each positioning time of the sequence of positioning times, a position estimate, checking, in response to the reception of the position estimate, whether the position estimate fulfills a predetermined quality criterion and, if the position estimate does not fulfill the predetermined quality criterion, filtering out the position estimate.

8. The method of claim 7, wherein filtering out the position estimate comprises omitting to perform the Viterbi algorithm for the positioning time and omitting to add the positioning time of the position estimate to the hidden Markov model instance.

9. The method of any one of claims 1 to 8, comprising providing the received position estimate as corrected position estimate for a positioning time if the determination of a corrected position estimate using the Viterbi algorithm takes longer than a predetermined threshold.

10. The method of any one of claims 1 to 9, wherein determining (1006) the corrected position estimate from the candidate path segment comprises setting the corrected position estimate to a reference position predefined for the candidate path segment.

11. The method of any one of claims 1 to 10, wherein the movable object is a vehicle.

12. The method of any one of claims 1 to 11, wherein the position estimates are satellite navigation positioning system position estimates.

13. The method of any one of claims 1 to 12, comprising receiving position estimates for multiple movable objects, maintaining an HMM instance for each unique movable object and determining corrected position estimates for each movable object.

14. The method of any one of claims 1 to 13, comprising trimming the HMM by removing states with oldest positioning times if the length of the HMM has exceeded a predetermined maximum length.

15. The method of any one of claims 1 to 14, comprising providing the corrected position estimate in real-time in response to the reception of the position estimate.

16. A server computer (1100) comprising a radio interface (1101), a memory interface (1103) and a processing unit (1102) configured to perform the method of any one of claims 1 to 15.

17. A computer program element comprising program instructions, which, when executed by one or more processors, cause the one or more processors to perform the method of any one of claims 1 to 15.

18. A computer-readable medium comprising program instructions, which, when executed by one or more processors, cause the one or more processors to perform the method of any one of claims 1 to 15.