

Method and system for processing image data

Field of the Invention

The invention relates to a method and system for processing image data. More particularly, the invention relates to the processing of such data obtained from
5 scanning a network infrastructure for the detection and analysis of specific objects of interest, such as powerlines and other overhead conductors, and similar structures.

Background of the Invention

Any reference to or discussion of any document, act or item of knowledge in this
10 specification is included solely for the purpose of providing a context for the present invention. It is not suggested or represented that any of these matters or any combination thereof formed at the priority date part of the common general knowledge, or was known to be relevant to an attempt to solve any problem with which this specification is concerned.

15 Proposals have been made in the past for techniques for machine recognition of selected structures and objects from remote sensing data (eg. by telemetry), such as scanned image data from airborne laser scanning (ALS) or stereo-photogrammetry. From the data it is possible to extract three-dimensional point coordinate data. To avoid the cost and time of manual human interpretation of
20 the image data, it is then necessary to automate the processing of the data in order to associate individual points in space with recognisable objects. To this end a filtering algorithm is required to classify the point data in accordance with particular features of interest. The data defining the resulting objects can then be used in existing computer-based tools for map-making, 3D modelling, land
25 management, asset management, etc.

Examples of previous techniques are described in US Patent 5,296, 909, US Patent 7,046,841 and US Patent 7,397,548. However, previous approaches are relatively rudimentary and can suffer from high levels of error (both false positives and false negatives), resulting in data output that is of relatively little value or requires so
30 much post-processing human intervention that the cost and time benefit of automation is partially or completely lost.

on all points allocated to each individual conductor vertical plane, to result in defined single catenaries representing individual conductors.

23. A method according to any one preceding claim, including the step of uniquely identifying and characterising each individual conductor.
- 5 24. A method according to claim 23, wherein the step of uniquely identifying and characterising each individual conductor comprises applying a least squares regression technique to determine the best fit catenary parameters.
25. A method according to any preceding claim, wherein the positions of end points of the particular conductors is determined by calculating intersect points between immediately adjacent conductors.
- 10 26. A method according to claim 25, further including the step of identifying powerline poles by analysing co-ordinate points not associated with conductors in the proximity of the end points of the conductors.
27. A method according to claim 26, wherein *a priori* and/or *a posteriori* information regarding the powerline poles is used to refine the positions of end points of the conductors.
- 15 28. A method of processing image data obtained from scanning a network infrastructure in order to identify conductors, said data comprising a plurality of co-ordinate points in three-dimensional space, the method including the steps of:
- 20 (a) analysing the co-ordinate points to identify sets of co-ordinate points indicative of a set of substantially parallel lines; and
- (b) analysing the co-ordinate points on the basis of said identified substantially parallel lines thereby to identify and map hanging catenaries representing said conductors.
- 25 29. A method according to claim 28, wherein the substantially parallel lines represent either substantially parallel vertical planes or substantially parallel vertically separated hanging catenaries.
- 30 30. A computer software product including logic functionality to carry out the method according to any one of claims 1 to 29 when provided with a

on all points allocated to each individual conductor vertical plane, to result in defined single catenaries representing individual conductors.

23. A method according to any one preceding claim, including the step of uniquely identifying and characterising each individual conductor.
- 5 24. A method according to claim 23, wherein the step of uniquely identifying and characterising each individual conductor comprises applying a least squares regression technique to determine the best fit catenary parameters.
25. A method according to any preceding claim, wherein the positions of end points of the particular conductors is determined by calculating intersect points between immediately adjacent conductors.
- 10 26. A method according to claim 25, further including the steps of identifying powerline poles by analysing co-ordinate points not associated with conductors in the proximity of the end points of the conductors.
27. A method according to claim 26, wherein *a priori* and/or *a posteriori*
- 15 information regarding the powerline poles is used to refine the positions of end points of the conductors.
28. A method of processing image data obtained from scanning a network infrastructure in order to identify conductors, said data comprising a plurality of co-ordinate points in three-dimensional space, the method including the steps of:
- 20 (a) analysing the co-ordinate points to identify sets of co-ordinate points indicative of a plurality of substantially parallel lines; and
- (b) analysing said identified set of co-ordinate points indicative of a plurality of substantially parallel lines thereby to identify and map hanging catenaries representing said conductors.
- 25 29. A method according to claim 28, wherein the substantially parallel lines represent either substantially parallel vertical planes or substantially parallel vertically separated hanging catenaries.
30. A computer software product including logic functionality to carry out the method according to any one of claims 1 to 29 when provided with a