CLAIMS

1. A railway track recognition apparatus comprising:

an index deriving unit which derives an index value, indicating railway-track-likeness, for each pixel or each pixel group of a captured image of train vehicle travelling direction;

an initial searching unit which determines a plurality of line segments between each of multiple points on a first end of an initial area and each of multiple points on a second end of the initial area, and selects, based on evaluation values obtained from the index values of the pixels or the index value of the pixel groups derived by the index deriving unit, a line segment having larger evaluation value than that of the other line segments, wherein the initial area is predetermined for the captured image;

a secondary searching unit which determines a plurality of line segments between a reference point on the second end side of the line segment selected by the initial searching unit and each of multiple points on a third end of a search area or determines a plurality of line segments

between a previous reference point on a third end side of a line segment selected by the secondary searching unit and each of multiple points on a third side of a search area, and selects, based on evaluation values obtained from the index values of the pixels or the index value of the pixel groups derived by the index deriving unit, a line segment having larger evaluation value than that of other line segments included in the search area; and

a railway track recognizing unit which recognizes a railway track based on the reference points.

2. The railway track recognition apparatus according to claim 1, wherein the search area is a triangle-shaped area formed by a first virtual line, a second virtual line and a third virtual line, wherein the first virtual line and the second virtual line are extended from the reference point with a given angle between the first and second virtual lines, and the third virtual line is a line connecting two opposite ends of the reference point of the first and second virtual lines.

3. The railway track recognition apparatus according to claim 1 or claim 2, further comprising:

a point searching unit which determines a point having the largest evaluation value by searching a given area centered on the reference point, and sets the point having the largest evaluation value to the reference point if the point having the largest evaluation value is not the reference point on the line segment selected by either the initial searching unit or the secondary searching unit.

4. The railway track recognition apparatus according to one of claims 1 to 3, further comprising:

a transforming unit which transforms the captured image into a bird-view image,

wherein, the initial searching unit and the secondary searching unit select the line segment based on the bird-view image.

5. A method for recognizing a railway track comprising:

calculating an index value, indicating railway-track-likeness, for each pixel or each pixel group of a captured image of train vehicle travelling direction;

determining a first plurality of line segments between each of multiple points on a first end of an initial area

and each of multiple points on a second end of the initial area, selecting, based on evaluation values obtained from the index values of the pixels or the index value of the pixel groups derived, a line segment having larger evaluation value than that of the other line segments, wherein the initial area is predetermined for the captured image;

determining a second plurality of line segments between a reference point on the second end side of the one line segment selected from the firs plurality of line segments and each of multiple points on a third end of a search area or determining a third plurality of line segments between a previous reference point on a third end side of one line segment selected from the second plurality of line segments and each of multiple points on a third side of a search area, and selecting, based on evaluation values obtained from the index values of the pixels or the index value of the pixel groups derived, a line segment having larger evaluation value than that of other line segments included in the search area; and

recognizing a railway track based on the reference points.

6. A computer program product comprising software instructions which, when implemented by a piece of computer device, carry out the method according to claim 5.