

What Is Claimed Is:

1. A computer-implemented method for facilitating detection and identification of vehicle parts, the method comprising:
 - storing a captured image of a vehicle, wherein the captured image includes a plurality of parts of the vehicle;
 - training a first algorithm based on at least images with pre-marked areas indicating final locations for multiple parts of the vehicle;
 - detecting, based on the trained first algorithm, a first area of the captured image in which a first part of the vehicle is located;
 - identifying, from a plurality of predetermined classes, a class corresponding to the first part in the detected first area, wherein the class indicates a location of the first part in relation to the vehicle; and
 - generating a result which indicates a list including an insurance claim item and corresponding damages based on the first area, the first part, and the class corresponding to the first part.

2. The method of claim 1, wherein detecting the first area comprises:
 - dividing the captured image into a grid of squares;
 - mapping, for a respective square, the respective square to a first number of target areas, wherein a respective target area comprises a bounding box associated with at least the respective square;
 - determining, for the respective target area, a confidence coefficient which indicates a likelihood that the respective target area corresponds to a first predetermined class;
 - determining, for the respective square, a probability which indicates a likelihood that the respective square corresponds to each of the predetermined classes; and
 - selecting, based on the confidence coefficient and the probability, a second area as the first area in which the first part of the vehicle is located, wherein the second area is selected from all target areas mapped to each of the squares.

3. The method of claim 2, wherein a second number of squares of the grid in a horizontal direction are the same as a second number of squares of the grid in a vertical direction, and wherein the first number and the second number are positive integers.

4. The method of claim 1, wherein prior to storing the captured image of the vehicle, the method further comprises:

acquiring a plurality of unsorted images of the vehicle, wherein the unsorted images are captured directly by a user of the vehicle; and

5 sorting the unsorted images by removing images which are irrelevant or abnormal to obtain a set of captured images which include the captured image.

10 5. The method of claim 1, ~~wherein detecting the first area is based on a first algorithm, and wherein prior to detecting the first area of the captured image, the method further comprises:~~

wherein training the first algorithm is further based on:

~~images with pre-marked areas indicating final locations for multiple parts of the vehicle; and~~

15 a plurality of sample images of a predetermined class corresponding to a respective part of the vehicle.

~~6. The method of claim 5, wherein detecting the first area is further based on the trained first algorithm.~~

20 ~~7.6.~~ The method of claim ~~15~~, wherein the first algorithm is a You Only Look Once v2 (yolov2) algorithm, and wherein the first algorithm further comprises a model based on a neural network.

~~8.7.~~ The method of claim 1, wherein a class includes one or more of:

25 a left front door;

a right front door;

a left rear door;

a right rear door;

a front bumper;

30 a rear bumper;

a left front wheel fender;

a right front wheel fender;

a left rear wheel fender;

a right rear wheel fender;

35 a left front tire;

a right front tire;
 a left rear tire;
 a right rear tire;
 a lower grille;
 5 a middle grille;
 a left headlight;
 a right headlight;
 a left brake light;
 a right brake light;
 10 a left front emergency light;
 a right front emergency light;
 a left rear emergency light;
 a right rear emergency light;
 a number plate;
 15 a front engine hood; and
 a trunk.

9.8. A computer system for facilitating detection and identification of vehicle parts, the system comprising:

20 a processor; and
 a memory coupled to the processor and storing instructions, which when executed by the processor cause the processor to perform a method, wherein the computer system is a storage device, the method comprising:

25 storing a captured image of a vehicle, wherein the captured image includes a plurality of parts of the vehicle;

training a first algorithm based on at least images with pre-marked areas indicating final locations for multiple parts of the vehicle;

detecting, based on the trained first algorithm, a first area of the captured image in which a first part of the vehicle is located;

30 identifying, from a plurality of predetermined classes, a class corresponding to the first part in the detected first area, wherein the class indicates a location of the first part in relation to the vehicle; and

generating a result which indicates a list including an insurance claim item and corresponding damages based on the first area, the first part, and the class corresponding to the first part.

~~10.9.~~ The computer system of claim ~~89~~, wherein detecting the first area comprises:
 dividing the captured image into a grid of squares;
 mapping, for a respective square, the respective square to a first number of target areas,
 wherein a respective target area comprises a bounding box associated with at least the respective
 5 square;
 determining, for the respective target area, a confidence coefficient which indicates a
 likelihood that the respective target area corresponds to a first predetermined class;
 determining, for the respective square, a probability which indicates a likelihood that the
 respective square corresponds to each of the predetermined classes; and
 10 selecting, based on the confidence coefficient and the probability, a second area as the
 first area in which the first part of the vehicle is located, wherein the second area is selected from
 all target areas mapped to each of the squares.

~~11.10.~~ The computer system of claim ~~910~~, wherein a second number of squares of the
 15 grid in a horizontal direction are the same as a second number of squares of the grid in a vertical
 direction, and wherein the first number and the second number are positive integers.

~~12.11.~~ The computer system of claim ~~89~~, wherein prior to storing the captured image of
 the vehicle, the method further comprises:
 20 acquiring a plurality of unsorted images of the vehicle, wherein the unsorted images are
 captured directly by a user of the vehicle; and
 sorting the unsorted images by removing images which are irrelevant or abnormal to
 obtain a set of captured images which include the captured image.

~~13.12.~~ The computer system of claim ~~89~~, ~~wherein detecting the first area is based on a~~
~~first algorithm, and wherein prior to detecting the first area of the captured image, the method~~
~~further comprises:~~

wherein training the first algorithm is further based on:

~~images with pre-marked areas indicating final locations for multiple parts of the~~
 30 ~~vehicle; and~~

a plurality of sample images of a predetermined class corresponding to a
 respective part of the vehicle.

~~14.~~ The computer system of claim ~~13~~, ~~wherein detecting the first area is further based~~
 35 ~~on the trained first algorithm.~~

~~15.13.~~ The computer system of claim ~~813~~, wherein the first algorithm is a You Only Look Once v2 (yolov2) algorithm, and wherein the first algorithm further comprises a model based on a neural network.

5 ~~16.14.~~ The computer system of claim ~~89~~, wherein a class includes one or more of:

- a left front door;
- a right front door;
- a left rear door;
- a right rear door;
- 10 a front bumper;
- a rear bumper;
- a left front wheel fender;
- a right front wheel fender;
- a left rear wheel fender;
- 15 a right rear wheel fender;
- a left front tire;
- a right front tire;
- a left rear tire;
- a right rear tire;
- 20 a lower grille;
- a middle grille;
- a left headlight;
- a right headlight;
- a left brake light;
- 25 a right brake light;
- a left front emergency light;
- a right front emergency light;
- a left rear emergency light;
- a right rear emergency light;
- 30 a number plate;
- a front engine hood; and
- a trunk.

~~17.15.~~ A non-transitory computer-readable storage medium storing instructions that

35 when executed by a computer cause the computer to perform a method for facilitating detection

and identification of vehicle parts, the method comprising:

storing a captured image of a vehicle, wherein the captured image includes a plurality of parts of the vehicle;

training a first algorithm based on at least images with pre-marked areas indicating final locations for multiple parts of the vehicle;

detecting, based on the trained first algorithm, a first area of the captured image in which a first part of the vehicle is located;

identifying, from a plurality of predetermined classes, a class corresponding to the first part in the detected first area, wherein the class indicates a location of the first part in relation to the vehicle; and

generating a result which indicates a list including an insurance claim item and corresponding damages based on the first area, the first part, and the class corresponding to the first part.

~~18.16.~~ The storage medium of claim ~~15~~¹⁷, wherein prior to storing the captured image of the vehicle, the method further comprises:

acquiring a plurality of unsorted images of the vehicle, wherein the unsorted images are captured directly by a user of the vehicle; and

sorting the unsorted images by removing images which are irrelevant or abnormal to obtain a set of captured images which include the captured image.

~~19.17.~~ The storage medium of claim ~~15~~¹⁷, ~~wherein detecting the first area is based on a first algorithm, and wherein prior to detecting the first area of the captured image, the method further comprises:~~

wherein training the first algorithm is further based on:

~~images with pre-marked areas indicating final locations for multiple parts of the vehicle; and~~

a plurality of sample images of a predetermined class corresponding to a respective part of the vehicle;

~~wherein detecting the first area is further based on the trained first algorithm.~~

~~20.18.~~ The storage medium of claim ~~15~~¹⁷, wherein a class includes one or more of:

a left front door;

a right front door;

a left rear door;

a right rear door;
 a front bumper;
 a rear bumper;
 a left front wheel fender;
 5 a right front wheel fender;
 a left rear wheel fender;
 a right rear wheel fender;
 a left front tire;
 a right front tire;
 10 a left rear tire;
 a right rear tire;
 a lower grille;
 a middle grille;
 a left headlight;
 15 a right headlight;
 a left brake light;
 a right brake light;
 a left front emergency light;
 a right front emergency light;
 20 a left rear emergency light;
 a right rear emergency light;
 a number plate;
 a front engine hood; and
 a trunk.

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19. The storage medium of claim 15, wherein detecting the first area comprises:
dividing the captured image into a grid of squares;
mapping, for a respective square, the respective square to a first number of target areas,
wherein a respective target area comprises a bounding box associated with at least the respective
 30 square;
determining, for the respective target area, a confidence coefficient which indicates a
likelihood that the respective target area corresponds to a first predetermined class;
determining, for the respective square, a probability which indicates a likelihood that the
respective square corresponds to each of the predetermined classes; and
 35 selecting, based on the confidence coefficient and the probability, a second area as the

first area in which the first part of the vehicle is located, wherein the second area is selected from all target areas mapped to each of the squares.

- 5 20. The storage medium of claim 19, wherein a second number of squares of the grid in a horizontal direction are the same as a second number of squares of the grid in a vertical direction, and wherein the first number and the second number are positive integers.