

What is claimed is:

1. A method for identifying a damaged part of a vehicle, comprising:

acquiring, by a client device, a captured image of the vehicle;

determining, by the client device, a damaged area based on an act of marking a damage

5 location in said captured image, and thereby forming a marked image;

sending, by the client device, said marked image to a server;

identifying, by the server, feature parts in said marked image, and determining a relative positional relationship between said feature parts and said damaged area based on the positions of said feature parts and said damaged area in the marked image, said relative

10 positional relationship between said feature parts and said damaged area including one of the direction of said feature parts with respect to said damaged area, the distance from said feature parts to said damaged area, and the distance percentage of the distance from said feature parts to said damaged area, or a combination thereof;

matching, by the server, said relative positional relationship in a feature correspondence

15 library to obtain a corresponding related part, said feature correspondence library is established based on a feature library which is constructed from a plurality of feature parts of the vehicle, and the feature correspondence library includes data for positional relationship between parts of the vehicle, and the feature library and the feature correspondence library are both established in advance; and

20 determining, by the server, the damaged part in said captured image based on said related part.

~~2. A method for identifying a damaged part of a vehicle, comprising:—~~

~~receiving a marked image uploaded by a client, said marked image including a damaged~~

25 ~~area determined based on an act of marking a damage location in a captured image;—~~

identifying feature parts in said marked image, and determining a relative positional relationship between said feature parts and said damaged area based on the positions of said feature parts and said damaged area in the marked image, said relative positional relationship between said feature parts and said damaged area including one of the direction of said feature parts with respect to said damaged area, the distance from said feature parts to said damaged area, and the distance percentage of the distance from said feature parts to said damaged area, or a combination thereof;—

matching the relative positional relationship in a feature correspondence library to obtain a corresponding related part; and

determining the damaged part in said captured image based on said related part.

3. The method according to claim 2, wherein,

said feature parts comprise vehicle parts included in a constructed feature library, and said feature correspondence library comprises part positional relationship data constructed by using the vehicle parts in said feature library as a reference, the part positional relationship data including relationship data characterizing at least one of a related part to which an area between vehicle parts pertains, a related part to which the area in a specified direction of a vehicle part pertains, and a related part to which an area of specified proportion between vehicle parts pertains.

4. The method according to claim 2, wherein determining the relative positional relationship between said feature parts and said damaged area comprises:—

constructing a coordinate system by using a center point of said damaged area as an origin;—

determining position coordinate data of said feature parts in said coordinate system, respectively; and—

determining the relative positional relationship between said feature parts and said damaged area based on the position coordinate data of said feature parts.

5. The method according to claim 4, further comprising selecting, if it is identified that the number N of the feature parts in said marked image is greater than 3, K feature parts from the N feature parts to determine the relative positional relationship between said damaged area and said K feature reference parts, wherein  $2 \leq K \leq 3$ .

6. The method according to claim 5, wherein determining the relative positional relationship between said feature parts and said damaged area based on the position coordinate data of said feature parts comprises:

transforming said damaged area into a corresponding first regular geometric figure according to the shape of said damaged area;—

constructing, in said coordinate system, second regular geometric figures including said origin and position coordinate data of at least two feature parts;—

calculating size of feature area of the first regular geometric figure included in said second regular geometric figures, respectively;—

determining a scope information on scope of said damaged area between said feature parts based on the sizes of said feature areas and the coordinate distances of said feature parts; and

determining the relative positional relationship between said feature parts and said damaged area based on matching of said scope information.

7. The method according to claim 2, further comprising:

acquiring, if no positional relationship data matching said relative positional

~~relationship is found in said feature correspondence library, positional relationship data having the highest matching degree with said relative positional relationship; and~~  
~~using the related part corresponding to the positional relationship data having the highest matching degree as the related part that matches said relative positional~~  
5 ~~relationship.~~

82. A method for identifying a damaged part of a vehicle, comprising:

acquiring, by a client device, a captured image of the vehicle and sending said captured image to a server;

10 identifying, by the server, a first damage location in said captured image, and marking said first damage location in said captured image, thereby generating a marked image;

sending, by the server, said marked image to said client device;

displaying, by the client device, mark information of the first damage location in said marked image;

15 confirming, by the client device, a vehicle damage location based on received interaction, said vehicle damage location including said first damage location;

sending, by the client device, an auxiliary damage image of which the vehicle damage location has been confirmed to the server;

20 identifying, by said server, at least one feature part included in said auxiliary damage image, after receiving said auxiliary damage image;

determining, by the server, a relative positional relationship between said feature part and said vehicle damage location in said auxiliary damage image, said relative positional relationship between said feature parts and said vehicle damage location including one of the direction of said feature parts with respect to said vehicle damage  
25 location, the distance from said feature parts to said vehicle damage location, and the

distance percentage of the distance from said feature parts to said vehicle damage location, or a combination thereof;

matching, by said server, said relative positional relationship in a feature correspondence library to obtain a corresponding related part, said feature correspondence library is established based on a feature library which is constructed from a plurality of feature parts of the vehicle, and the feature correspondence library includes data for positional relationship between parts of the vehicle, and the feature library and the feature correspondence library are both established in advance; and

determining, by the server, the damaged part in said captured image based on said related part.

~~9. A method for identifying a damaged part of a vehicle, comprising:—~~

~~acquiring a captured image uploaded by a client, identifying a first damage location in said captured image, and marking said first damage location in said captured image, thereby generating a marked image;—~~

~~sending said marked image to said client;—~~

~~receiving an auxiliary damage image returned from the client, identifying at least one feature part included in said auxiliary damage image, said auxiliary damage image including image information formed by confirming a vehicle damage location in said marked image based on an interaction;—~~

~~determining a relative positional relationship between said feature part and the vehicle damage location in said auxiliary damage image, said relative positional relationship between said feature parts and said vehicle damage location including one of the direction of said feature parts with respect to said vehicle damage location, the distance from said feature parts to said vehicle damage location, and the distance percentage of the distance from said feature parts to said vehicle damage location, or a combination~~

thereof; and

~~matching said relative positional relationship in a feature correspondence library to obtain a corresponding related part, and determining the damaged part in said captured image based on said related part.~~

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~~10. The method according to claim 9, wherein said auxiliary damage image further comprises mark information of a second damage location, the second damage location including a new vehicle damage location added to said marked image.~~

10 ~~11. A method for identifying a damaged part of a vehicle, comprising:~~

~~acquiring a captured image of the vehicle;~~

~~determining a damaged area based on an act of marking a damage location in said captured image, thereby forming a marked image;—~~

15 ~~identifying feature parts in said marked image, and determining a relative positional relationship between said feature parts and said damaged area based on the positions of said feature parts and said damaged area in the marked image, said relative positional relationship between said feature parts and said damaged area including one of the direction of said feature parts with respect to said damaged area, the distance from said feature parts to said damaged area, and the distance percentage of the distance from~~  
20 ~~said feature parts to said damaged area, or a combination thereof;—~~

~~matching said relative positional relationship in a feature correspondence library to obtain a corresponding related part; and—~~

~~determining the damaged part in said captured image based on said related part.~~

25 ~~12. A method for identifying a damaged part of a vehicle, comprising:~~

~~acquiring a captured image of the vehicle, identifying a first damage location in said captured image, and marking said first damage location in said captured image, thereby generating a marked image;—~~

~~displaying mark information of the first damage location in said marked image;—~~

5 ~~confirming a vehicle damage location based on a received interaction to form an auxiliary damage image, said vehicle damage location including said first damage location;—~~

~~identifying at least one feature part included in said auxiliary damage image;—~~

10 ~~determining a relative positional relationship between said feature parts and the vehicle damage location in said auxiliary damage image, said relative positional relationship between said feature parts and the vehicle damage location including one of the direction of said feature parts with respect to the vehicle damage location, the distance from said feature parts to the vehicle damage location, and the distance percentage of the distance from said feature parts to the vehicle damage location, or a combination thereof; and~~

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~~matching said relative positional relationship in a feature correspondence library to obtain a corresponding related part, and determining the damaged part in said captured image based on said related part.~~

20 133. An apparatus for identifying a damaged part of a vehicle, comprising:

a receiving module for receiving a marked image uploaded by a client device, said marked image including a damaged area determined based on an act of marking a damage location in a captured image;

a positional relationship determining module for identifying feature parts in said marked image, and determining a relative positional relationship between said feature parts and said damaged area based on the positions of said feature parts and said

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damaged area in the marked image, said relative positional relationship between said feature parts and said damaged area including one of the direction of said feature parts with respect to said damaged area, the distance from said feature parts to said damaged area, and the distance percentage of the distance from said feature parts to said damaged area, or a combination thereof;

a matching module for matching said relative positional relationship in a feature correspondence library to obtain a corresponding related part, said feature correspondence library is established based on a feature library which is constructed from a plurality of feature parts of the vehicle, and the feature correspondence library includes data for positional relationship between parts of the vehicle, and the feature library and the feature correspondence library are both established in advance; and

a part identifying module for determining the damaged part in said captured image based on said related part.

~~144.~~ The apparatus according to claim ~~133~~, further comprising:

a feature library for storing vehicle parts of the vehicle; and

a feature correspondence library for storing part positional relationship data constructed by using the vehicle parts in said feature library as a reference, said part positional relationship data including relationship data characterizing at least one of a related part to which an area between vehicle parts pertains, a related part to which the area in a specified direction of a vehicle part pertains, and a related part to which an area of specified proportion between vehicle parts pertains.

~~155.~~ The apparatus according to claim ~~133~~, wherein said positional relationship determining module is configured to:

construct a coordinate system by using the center point of said damaged area as an

origin;

determine position coordinate data of said feature parts in said coordinate system, respectively; and

determine the relative positional relationship between said feature parts and said  
5 damaged area based on the position coordinate data of said feature parts.

166. The apparatus according to claim 155, wherein said positional relationship determining module comprises:

a feature selecting unit for selecting, when it is identified that the number N of the  
10 feature parts in said marked image is greater than 3, K feature parts from the N feature parts to determine the relative positional relationship between said damaged area and said K feature reference parts, wherein  $2 \leq K \leq 3$ .

177. The apparatus according to claim 166, wherein said positional relationship  
15 determining module is configured to:

transform said damaged area into a corresponding first regular geometric figure according to the shape of said damaged area;

construct, in said coordinate system, second regular geometric figures including said origin and position coordinates data of at least two feature parts;

20 calculate size of feature area of the first regular geometric figure included in said second regular geometric figures, respectively;

determine a scope information on scope of said damaged area between said feature parts based on the sizes of said feature areas and the coordinate distances of said feature parts; and

25 determine the relative positional relationship between said feature parts and said

damaged area based on the matching of said scope information.

~~188~~. The apparatus according to claim ~~144~~, wherein,

if no positional relationship data matching said relative positional relationship is found  
5 in said feature correspondence library by said matching module, positional relationship  
data having the highest matching degree with said relative positional relationship is  
acquired; and

the related part corresponding to the positional relationship data having said highest  
matching degree is used as the related part that matches said relative positional  
10 relationship.

~~199~~. An apparatus for identifying a damaged part of a vehicle, comprising:

an image marking module for acquiring a captured image uploaded by a client device,  
identifying a first damage location in said captured image, and marking said first  
15 damage location in said captured image, thereby generating a marked image;

a mark sending module for sending said marked image to said client device;

an auxiliary interacting module for receiving an auxiliary damage image returned from  
the client device, and identifying at least one feature part included in said auxiliary  
damage image, said auxiliary damage image including image information formed by  
20 confirming a vehicle damage location in said marked image based on an interaction;

a position determining module for determining a relative positional relationship  
between said feature parts and the vehicle damage location in said auxiliary damage  
image, said relative positional relationship between said feature parts and the vehicle  
damage location including one of the direction of said feature parts with respect to the  
25 vehicle damage location, the distance from said feature parts to the vehicle damage  
location, and the distance percentage of the distance from said feature parts to the

vehicle damage location, or a combination thereof; and

a part identifying module for matching said relative positional relationship in a feature correspondence library to obtain a corresponding related part, and determining the damaged part in said captured image based on said related part,

5    wherein said feature correspondence library is established based on a feature library which is constructed from a plurality of feature parts of the vehicle, and the feature correspondence library includes data for positional relationship between parts of the vehicle, and the feature library and the feature correspondence library are both established in advance.

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~~20~~10. The apparatus according to claim 49, wherein said auxiliary damage image received by said auxiliary interacting module further comprises mark information of a second damage location, said second damage location including a new vehicle damage location added to said marked image.

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~~24~~11. A server comprising a processor and a memory for storing processor-executable instructions, wherein upon execution of said instructions, said processor is configured to:

receive a marked image uploaded by a client device, said marked image including a  
20    damaged area determined based on an act of marking a damage location in a captured image;

identify feature parts in said marked image, and determine a relative positional relationship between said feature parts and said damaged area based on the positions of said feature parts and said damaged area in the marked image, said relative positional  
25    relationship between said feature parts and said damaged area including one of the direction of said feature parts with respect to said damaged area, the distance from said

feature parts to said damaged area, and the distance percentage of the distance from said feature parts to said damaged area, or a combination thereof;

match said relative positional relationship in a feature correspondence library to obtain a corresponding related part, said feature correspondence library is established based on a feature library which is constructed from a plurality of feature parts of the vehicle, and the feature correspondence library includes data for positional relationship between parts of the vehicle, and the feature library and the feature correspondence library are both established in advance; and

determine the damaged part in said captured image based on said related part.

~~22~~12. A server comprising a processor and a memory for storing processor-executable instructions, wherein upon execution of said instructions, said processor is configured to:

acquire a captured image uploaded by a client device, identify a first damage location in said captured image, and mark said first damage location in said captured image, thereby generating a marked image;

send said marked image to said client device;

receive an auxiliary damage image returned from the client device, and identify at least one feature part included in said auxiliary damage image, said auxiliary damage image including image information formed by confirming a vehicle damage location in said marked image based on an interaction;

determine a relative positional relationship between said feature parts and the vehicle damage location in said auxiliary damage image, said relative positional relationship between said feature parts and the vehicle damage location including one of the direction of said feature parts with respect to the vehicle damage location, the distance from said feature parts to the vehicle damage location, and the distance percentage of

the distance from said feature parts to the vehicle damage location, or a combination thereof; and

match said relative positional relationship in a feature correspondence library to obtain a corresponding related part, and determine the damaged part in said captured image based on said related part, said feature correspondence library is established based on a feature library which is constructed from a plurality of feature parts of the vehicle, and the feature correspondence library includes data for positional relationship between parts of the vehicle, and the feature library and the feature correspondence library are both established in advance.

2313. An electronic device comprising a display, a processor and a memory storing processor-executable instructions, wherein upon execution of said instructions, said processor is configured to:

acquire a captured image of a vehicle;

determine a damaged area based on an act of marking a damage location in said captured image on the display, thereby forming a marked image;

identify feature parts in said marked image, and determine a relative positional relationship between said feature parts and said damaged area based on the positions of said feature parts and said damaged area in the marked image, said relative positional relationship between said feature parts and said damaged area including one of the direction of said feature parts with respect to said damaged area, the distance from said feature parts to said damaged area, and the distance percentage of the distance from said feature parts to said damaged area, or a combination thereof;

match said relative positional relationship in a feature correspondence library to obtain a corresponding related part, said feature correspondence library is established based on a feature library which is constructed from a plurality of feature parts of the vehicle, and the feature correspondence library includes data for positional relationship between

parts of the vehicle, and the feature library and the feature correspondence library are both established in advance; and

determine the damaged part in said captured image based on said related part.

- 5     2414. An electronic device comprising a display, a processor and a memory storing processor-executable instructions, wherein upon execution of said instructions, said processor is configured to:

acquire a captured image of a vehicle, identify a first damage location in said captured image, and mark said first damage location in said captured image, thereby generating  
10     a marked image;

display, on said display, mark information of the first damage location in said marked image;

confirming a vehicle damage location based on received interaction to form an auxiliary damage image, said vehicle damage location including said first damage location;

- 15     identify at least one feature part included in said auxiliary damage image;

determine a relative positional relationship between said feature parts and the vehicle damage location in said auxiliary damage image, said relative positional relationship between said feature parts and the vehicle damage location including one of the direction of said feature parts with respect to the vehicle damage location, the distance  
20     from said feature parts to the vehicle damage location, and the distance percentage of the distance from said feature parts to the vehicle damage location, or a combination thereof; and

matching said relative positional relationship in a feature correspondence library to obtain a corresponding related part, and determine the damaged part in said captured  
25     image based on said related part, said feature correspondence library is established based on a feature library which is constructed from a plurality of feature parts of the

vehicle, and the feature correspondence library includes data for positional relationship between parts of the vehicle, and the feature library and the feature correspondence library are both established in advance.