CLAIMS

1. A method of classifying a game prop, comprising:

inputting a to-be-processed image involving a target game prop into a pre-trained ~~first~~ target feature extraction~~classification~~ network;

inputting a feature extracted from the to-be-processed image by the target feature extraction network to a pre-trained target prop classification network;

obtaining a class of the target game prop output by the ~~first~~ target prop classification network~~,~~;

wherein the ~~first~~ target prop classification network and an intermediate feature extraction network ~~and a second target classification network~~ are obtained by a first joint~~ly~~ training of an initial prop classification network and an initial feature extraction network based on a first sample image and a prop classification loss~~first initial classification network and a second initial classification network, and the first initial classification network and the second initial classification network share a same initial feature extraction network~~;

the ~~first initial classification~~target feature extraction network and a target environment classification network is ~~configured to classify a game prop involved in an input image based on a feature extracted by the initial feature extraction network from the input image~~obtained by a second joint training of the intermediate feature extraction network and an initial environment classification network based on the first sample image, a second sample image and an environment classification loss;

~~the second initial classification network is configured to classify a game environment where the game prop involved in the input image is located based on a feature extracted by the initial feature extraction network from the input image.~~

~~2. The method according to claim 1, wherein~~

~~the first initial classification network is trained based on a prop classification loss, and~~ the prop classification loss indicates a classification loss of the ~~first~~ initial prop classification network classifying a game prop involved in the~~a~~ first sample image based on a feature extracted ~~o~~from the first sample image by the initial feature extraction network;

~~the second initial classification network is trained based on an environment classification loss, and~~ the environment classification loss indicates a classification loss of the ~~second~~ initial environment classification network classifying a game environment where ~~a~~ the game prop involved in the~~a~~ first sample image or the~~a~~ second sample image is located

based on a feature ~~of~~ extracted from the first sample image or the second sample image by the intermediate feature extraction network~~;~~

~~the feature of the first sample image and the feature of the second sample image are both obtained by the initial feature extraction network~~.

~~3. The method according to claim 2, wherein~~

~~the first initial classification network comprises:~~

~~the initial feature extraction network configured to perform feature extraction for the input image and~~

~~an initial prop classification network configured to classify the game prop involved in the input image based on a feature extracted by the initial feature extraction network;~~

~~the second initial classification network comprises:~~

~~the initial feature extraction network and~~

~~an initial environment classification network configured to classify the game environment where the game prop involved in the input image is located based on a feature extracted by the initial feature extraction network;~~

~~the method further comprises:~~

~~obtaining an intermediate classification network comprising an intermediate feature extraction network and a target prop classification network by first training the initial feature extraction network and the initial prop classification network based on the first sample image and the prop classification loss;~~

~~obtaining a target feature extraction network and a target environment classification network by second training the intermediate feature extraction network and the initial environment classification network based on the first sample image, the second sample image, and the environment classification loss, wherein the first target classification network comprises the target feature extraction network and the target prop classification network.~~

4~~3~~2. The method according to claim ~~3~~1, wherein the environment classification loss comprises:

a first loss indicating a difference between a game environment class predicted by the initial environment classification network and a true game environment class where the game prop involved in the first sample image or the second sample image is located, and

a second loss indicating a capability of the initial environment classification network for identifying a game environment class to which a feature extracted by the intermediate feature extraction network belongs.

~~5~~3. The method according to claim ~~4~~2, wherein ~~obtaining the target feature extraction network and the target environment classification network by~~ the second joint training of the intermediate feature extraction network and the initial environment classification network based on the first sample image, the second sample image, and the environment classification loss comprises:

obtaining the target environment classification network by fixing the intermediate feature extraction network and training the initial environment classification network based on the first loss, the first sample image, and the second sample image;

obtaining the target feature extraction network by fixing the target environment classification network and training the intermediate feature extraction network based on the second loss, the first sample image, and the second sample image.

~~6~~4. The method according to any one of claims ~~2-5~~1-3, wherein

the first sample image and the second sample image are screened out from game images based on a preset condition,

the game images are obtained by imaging a game area, and

the preset condition comprises that a preset event relating to a game prop occurred in the game area is detected from the game image.

~~7~~5. The method according to any one of claims ~~2~~1-~~6~~4, further comprising:

obtaining an image set comprising a first image sub-set and a second image sub-set, each image in the first image sub-set is marked with a first label, each image in the second image sub-set is not marked with the first label, and the first label indicates a class of a game prop;

marking images in the first image sub-set and images in the second image sub-set with different second labels, wherein the second label indicates a class of a game environment where a game prop is located;

determining an image in the first image sub-set as the first sample image; and

determining an image in the second image sub-set as the second sample image.

~~8~~6. A method of training a neural network, ~~being used to training a first target classification network from a first initial classification network, wherein the first target classification network is used to classify a game prop; and the method~~ comprisinges:

obtaining a first sample image and a second sample image;

obtaining an intermediate feature extraction network and a ~~the first~~ target prop classification network by a first joint~~ly~~ training of an~~the~~ ~~first~~ initial feature extraction ~~classification~~ network and an ~~second~~ initial prop classification network based on the first sample image and a prop classification loss~~the second sample image, wherein the first initial classification network and the second initial classification network share a same initial feature extraction network~~;

obtaining a target feature extraction network and a target environment classification network by a second joint training of the intermediate feature extraction network and an initial environment classification network based on the first sample image, the second sample image and an environment classification loss;

wherein ~~the first initial classification network is configured to classify a game prop involved in the first sample image based on a feature extracted by the initial feature extraction network from the first sample image;~~

~~the second initial classification network is configured to classify a game environment where a game prop involved in the first sample image or the second sample image is located based on a feature extracted by the initial feature extraction network from the first sample image or the second sample image.~~

~~9. The method according to claim 8, wherein~~

~~the first initial classification network is trained based on a prop classification loss, and~~ the prop classification loss indicates a classification loss of the ~~first~~ initial prop classification network classifying ~~the~~ a game prop involved in the first sample image based on ~~the~~ a feature extracted ~~o~~from the first sample image by the initial feature extraction network;

~~the second initial classification network is trained based on an environment classification loss, and~~ the environment classification loss indicates a classification loss of the ~~second~~ initial environment classification network classifying a game environment where the game prop involved in the first sample image or the second sample image is located based on the feature extracted from~~of~~ the first sample image or the second sample image by the intermediate feature extraction network.

~~10. The method according to claim 9, wherein~~

~~the first initial classification network comprises:~~

~~the initial feature extraction network configured to perform feature extraction on an input image and~~

~~an initial prop classification network configured to classify a game prop involved in the input image based on the feature extracted by the initial feature extraction network;~~

~~the second initial classification network comprises:~~

~~the initial feature extraction network and~~

~~an initial environment classification network configured to classify a game environment where the game prop involved in the input image is located based on the feature extracted by the initial feature extraction network;~~

~~jointly training the first initial classification network and the second initial classification network comprises:~~

~~obtaining an intermediate classification network comprising an intermediate feature extraction network and a target prop classification network by first training the initial feature extraction network and the initial prop classification network based on the first sample image and the prop classification loss;~~

~~obtaining a target feature extraction network and a target environment classification network by second training the intermediate feature extraction network and the initial environment classification network based on the first sample image, the second sample image, and the environment classification loss; the first target classification network comprises the target feature extraction network and the target prop classification network.~~

~~11~~7. The method according to claim ~~10~~6, wherein the environment classification loss comprises:

a first loss indicating a difference between a game environment class predicted by the initial environment classification network and a true game environment class where the game prop involved in the first sample image or the second sample image is located, and

a second loss indicating a capability of the initial environment classification network for identifying a game environment class to which a feature extracted by the intermediate feature extraction network belongs.

~~12~~8. The method according to claim ~~11~~7, wherein obtaining the target feature extraction network and the target environment classification network by the second joint training of the intermediate feature extraction network and the initial environment classification network based on the first sample image or the second sample image and the environment classification loss comprises:

obtaining the target environment classification network by fixing the intermediate feature extraction network and training the initial environment classification network based on the first loss, the first sample image, and the second sample image;

obtaining the target feature extraction network by fixing the target environment classification network and training the intermediate feature extraction network based on the second loss, the first sample image, and the second sample image.

~~13~~9. The method according to any one of claims ~~9-12~~6-8, wherein

the first sample image and the second sample image are screened out from game images based on a preset condition,

the game images are obtained by imaging a game area, and

the preset condition comprises that a preset event relating to a game prop occurred in the game area is detected from the game image.

~~14~~10. The method according to any one of claims ~~9-13~~6-9, further comprising:

obtaining an image set comprising a first image sub-set and a second image sub-set, each image in the first image sub-set is marked with a first label, each image in the second image sub-set is not marked with the first label, and the first label indicates a class of a game prop;

marking images in the first image sub-set and images in the second image sub-set with different second labels, wherein the second label indicates a class of a game environment where a game prop is located;

determining an image in the first image sub-set as the first sample image; and

determining an image in the second image sub-set as the second sample image.

~~15~~11. An apparatus for classifying a game prop, comprising:

an inputting module, configured to input a to-be-processed image involving a target game prop into a pre-trained ~~first~~ target feature extraction~~classification~~ network, and input a feature extracted from the to-be-processed image by the target feature extraction network to a pre-trained target prop classification network;

a classifying module, configured to obtain a class of the target game prop output by the ~~first~~ target prop classification network;

wherein the target prop classification network and an intermediate feature extraction network are obtained by a first joint training of an initial prop classification network and an initial feature extraction network based on a first sample image and a prop classification loss;

the target feature extraction network and a target environment classification network is obtained by a second joint training of the intermediate feature extraction network and an initial environment classification network based on the first sample image, a second sample image and an environment classification loss~~the first target classification network and a second target classification network are obtained by jointly training a first initial classification network and a second initial classification network, and the first initial classification network and the second initial classification network share a same initial feature extraction network;~~

~~the first initial classification network is configured to classify a game prop involved in an input image based on a feature extracted by the initial feature extraction network from the input image~~;

the prop classification loss indicates a classification loss of the initial prop classification network classifying a game prop involved in a first sample image based on a feature extracted from the first sample image by the initial feature extraction network;

the environment classification loss indicates a classification loss of the initial environment classification network classifying a game environment where the game prop

involved in a first sample image or a second sample image is located based on a feature extracted from the first sample image or the second sample image by the intermediate feature extraction networkthe second initial classification network is configured to classify a game environment where the game prop involved in the input image is located based on a feature extracted by the initial feature extraction network from the input image.

1612. An apparatus for training a neural network, being used to training a first target classification network from a first initial classification network, wherein the first target classification network is used to classify a game prop; and the apparatus comprises:

a sample image obtaining module, configured to obtain a first sample image and a second sample image;

a training module, configured to

obtain an intermediate feature extraction network and athe first target prop classification network by a first jointly training of anthe first initial feature extraction classification network and an second initial prop classification network based on the first sample image and the second sample image, wherein the first initial classification network and a prop classification loss;

obtain a target feature extraction network and a target environment classification network by a second joint training of the intermediate feature extraction network and an initial environment classification network based on the first sample image, the second sample image and an environment classification lossthe second initial classification network share a same initial feature extraction network;

wherein the prop classification loss indicates a classification loss of the initial prop classification network classifying a game prop involved in the first sample image based on a feature extracted from the first sample image by the initial feature extraction network;

the environment classification loss indicates a classification loss of the initial environment classification network classifying a game environment where the game prop involved in the first sample image or the second sample image is located based on the feature extracted from the first sample image or the second sample image by the intermediate feature extraction networkthe first initial classification network is configured to classify a game prop involved in the first sample image based on a feature extracted by the initial feature extraction network from the first sample image;

~~the second initial classification network is configured to classify a game environment where a game prop involved in the first sample image or the second sample image is located based on a feature extracted by the initial feature extraction network from the first sample image or the second sample image~~.

1~~7~~3. A computer readable storage medium storing computer programs, wherein the programs are executed by a processor to implement the method according to any one of claims 1-10~~4~~.

1~~4~~8. A computer device, comprising a memory, a processor and computer programs stored in the memory and run on the processor, wherein the programs are executed by the processor to implement the method according to any one of claims 1-10~~4~~.