

CLAIMS

1. A method, comprising:
obtaining, by one or more processors, a target image;
segmenting, by the one or more processors, a target region image from the target
5 image, wherein:
the target region image is segmented from the target image based at least in
part on a use of a segmentation model;
the segmentation model is trained using a machine learning process; and
the target region image comprises a target object region in the target image,
10 the target object region being identified using the segmentation model;
analyzing, by the one or more processors, the target region image based at least in part
on a machine learning model; and
obtaining by the one or more processors, a recognition result based at least in part on
the analysis of the target region image.
- 15 2. The method of claim 1, wherein the obtaining the recognition result comprises:
determining one or more probabilities corresponding to one or more first category
targets based at least in part on the analysis of the target region image; and
determining the recognition result based at least in part on the one or more
probabilities corresponding to the one or more first category targets.
- 20 3. The method of claim 2, wherein the one or more probabilities corresponding to the
one or more first category targets are one or more probabilities that a patient has one or more
diseases according to an image analysis of the target image.
4. The method of claim 2, wherein:
the first category targets include at least one of the following: a first target, a second
25 target, and a third target;
the machine learning model is a target recognition model;
the machine learning model is used to analyze the target image; and
determining the one or more probabilities corresponding to the one or more first
category targets comprises: analyzing the target image based at least in part on the target
30 recognition model, and determining a probability of a lesion in the target image being the first
target, a probability of the lesion being the second target, and a probability of the lesion being
the third target based on an analysis of the target image and the target recognition model.

5. The method of claim 4, wherein the target recognition model is trained or defined based at least in part on a set of training images, and at least a subset of the set of training images comprises images corresponding to a target organ subject to a disease associated with the first target, a disease associated with the second target, and a disease associated with the third target.
6. The method of claim 1, wherein:
the machine learning model is a lesion segmentation model; and
the analyzing the target region image based at least in part on the machine learning model and the obtaining the recognition result comprises:
10 segmenting a lesion in the target image based at least in part on the lesion segmentation model;
determining a location of the lesion and size of the lesion based at least in part on the lesion segmentation model;
adding a label to the location of the lesion and determining a volume
15 proportion of the lesion in the target image based at least in part on the size of the lesion; and
determining the recognition result based at least in part on the volume proportion of the lesion.
7. The method of claim 6, further comprising:
20 building, by the one or more processors, a multi-task, deep-learning network to learn lesion classification;
using an encoding module to extract underlying features from a target organ in a set of historical medical images;
building a classification task based at least in part on the extracted underlying
25 features, wherein the classification task corresponds to a task of classifying lesions in the target organ;
building a loss function based at least in part on the classification task; and
obtaining the lesion segmentation model based at least in part on a training using the loss function.
8. The method of claim 1, further comprising:
30 providing the recognition result to a client terminal; and
causing the client terminal to provide a prompt message indicating the recognition result or that the recognition result is available for viewing.

9. The method of claim 1, further comprising:
performing data masking with respect to a first medical image of a patient and
obtaining a second medical image; and
performing data filtering with respect to the second medical image and obtaining the
5 target image.
10. The method of claim 1, wherein:
the target region image is a lung region image; and
segmenting the target region image from the target image comprises:
using the segmentation model to segment the lung region image from the
10 target image, wherein, the segmentation model corresponds to a lung segmentation
model.
11. The method of claim 1, wherein the segmentation model used in connection with
segmenting the target region image is selected based at least in part on an organ comprised in
the target image.
12. A medical imaging analysis system, comprising:
15 medical imaging equipment configured to scan a patient and generate a first medical
image of the patient;
a front-end processor configured to:
perform data masking with respect to the first medical image to obtain a
20 second medical image;
perform data filtering with respect to the second medical image to obtain a
target image; and
communicate an image to be recognized to an analysis terminal; and
the analysis terminal configured to:
25 obtain the target image;
segment a target region image from the target image wherein:
the target region image is segmented from the target image based at
least in part on a use of a segmentation model;
the segmentation model is trained using a machine learning process;
30 and
the target region image comprises a target object region in the target
image, the target object region being identified using the segmentation model;
analyze the target region image based at least in part on a machine learning

model; and

obtain a recognition result based at least in part on the analysis of the target region image.

13. The analysis system of claim 12, wherein the analysis terminal is further configured to
5 synchronously communicate the recognition result to an image filing and communication system or to communicate the recognition result to a client terminal and cause the client terminal to display a prompt message.

14. A device, comprising:

one or more processors configured to:

10 obtain a target image;

segment a target region image from the target image, wherein:

the target region image is segmented from the target image based at least in part on a use of a segmentation model;

the segmentation model is trained using a machine learning process;

15 and

the target region image comprises a target object region in the target image, the target object region being identified using the segmentation model;
analyze the target region image based at least in part on a machine learning model; and

20 obtain a recognition result based at least in part on the analysis of the target region image; and

one or more memories coupled to the one or more processors, configured to provide the one or more processors with instructions.

15. A method, comprising:

25 obtaining, by one or more processors, a target image from a target image source, the target image being obtained based at least in part on one or more inputs corresponding to a user selection;

receiving, by the one or more processors, a user selection pertaining to an image analysis process;

30 determining, by the one or more processors, a target image analysis process based at least in part on the user selection of the image analysis process;

processing, by the one or more processors, the target image based at least in part on the target image analysis process, wherein the target image analysis process includes calling a

target machine learning model to process the target image;

obtaining, by the one or more processors, a recognition result associated with the target image or target data associated with the target image based at least in part on the image analysis process performed with respect to the target image; and

5 providing, by the one or more processors, the recognition result or the target data to a user via a user interface on a client terminal.

16. The method of claim 15, wherein determining the target image analysis process based at least in part on the user selection comprises:

obtaining at least one image analysis process corresponding to the target image
10 source;

presenting said at least one image analysis process;

receiving a selection signal input by the user; and

determining the target image analysis process from among the at least one image analysis process based at least in part on the selection signal.

15 17. The method of claim 15, wherein the target machine learning model is obtained based at least in part on a training of the target machine learning model by alternating between use of multiple first training samples and multiple second training samples, wherein each first training sample comprises data, a classification label for said data, and label information for target data within said data, and each second training sample comprises data and a
20 classification label for said data.

18. A computer program product, the computer program product being embodied in a non-transitory computer readable storage medium and comprising computer instructions for:

obtaining, by one or more processors, a target image;

segmenting, by the one or more processors, a target region image from the target
25 image, wherein:

the target region image is segmented from the target image based at least in part on a use of a segmentation model;

the segmentation model is trained using a machine learning process; and

the target region image comprises a target object region in the target image,
30 the target object region being identified using the segmentation model;

analyzing, by the one or more processors, the target region image based at least in part on a machine learning model; and

obtaining by the one or more processors, a recognition result based at least in part on

the analysis of the target region image.

19. A computer program product, the computer program product being embodied in a non-transitory computer readable storage medium and comprising computer instructions for:

obtaining, by one or more processors, a target image from a target image source, the
5 target image being obtained based at least in part on one or more inputs corresponding to a user selection;

receiving, by the one or more processors, a user selection pertaining to an image analysis process;

determining, by the one or more processors, a target image analysis process based at
10 least in part on the user selection image analysis process;

processing, by the one or more processors, the target image based at least in part on the target image analysis process, wherein the target image analysis process includes calling a target machine learning model to process the target image;

obtaining, by the one or more processors, a recognition result associated with the
15 target image or target data associated with the target image based at least in part on the image analysis process performed with respect to the target image; and

providing, by the one or more processors, the recognition result or the target data to a user via a user interface on a client terminal.