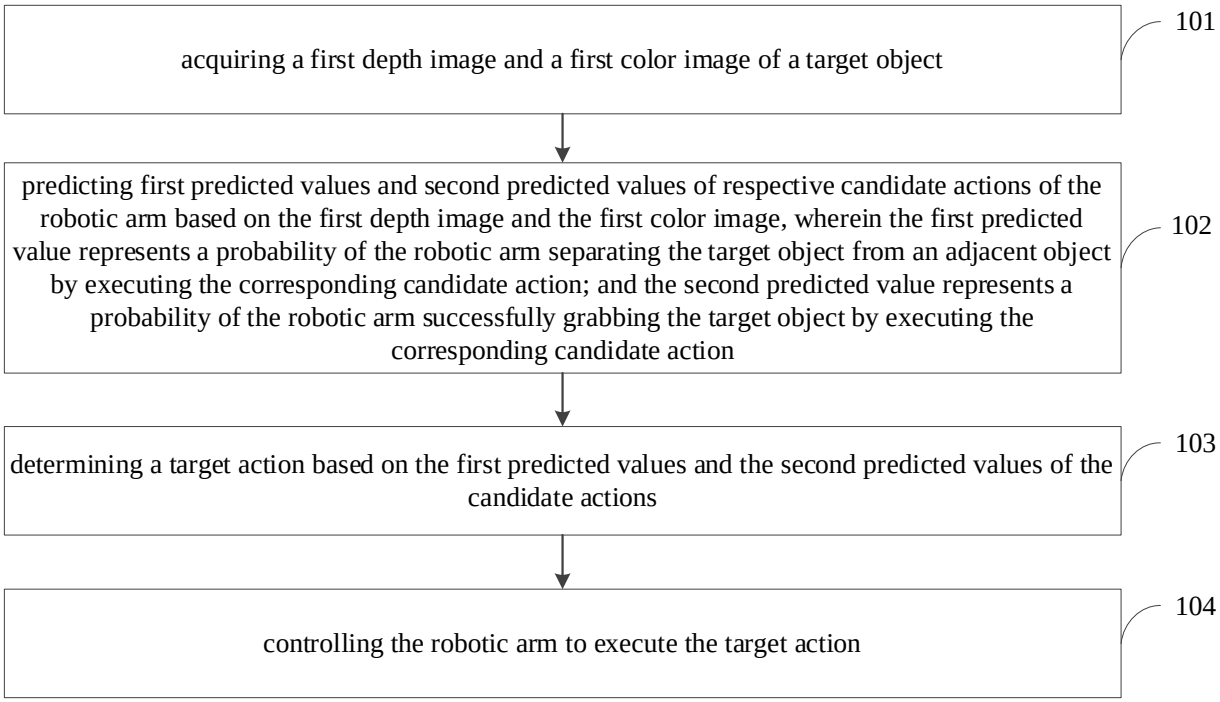

acquiring a first depth image and a first color image of a target object
101
predicting first predicted values and second predicted values of respective candidate actions of the robotic arm based on the first depth image and the first color image, wherein the first predicted value represents a probability of the robotic arm separating the target object from an adjacent object by executing the corresponding candidate action; and the second predicted value represents a probability of the robotic arm successfully grabbing the target object by executing the corresponding candidate action
102
determining a target action based on the first predicted values and the second predicted values of the candidate actions
103
controlling the robotic arm to execute the target action
104

FIG. 1

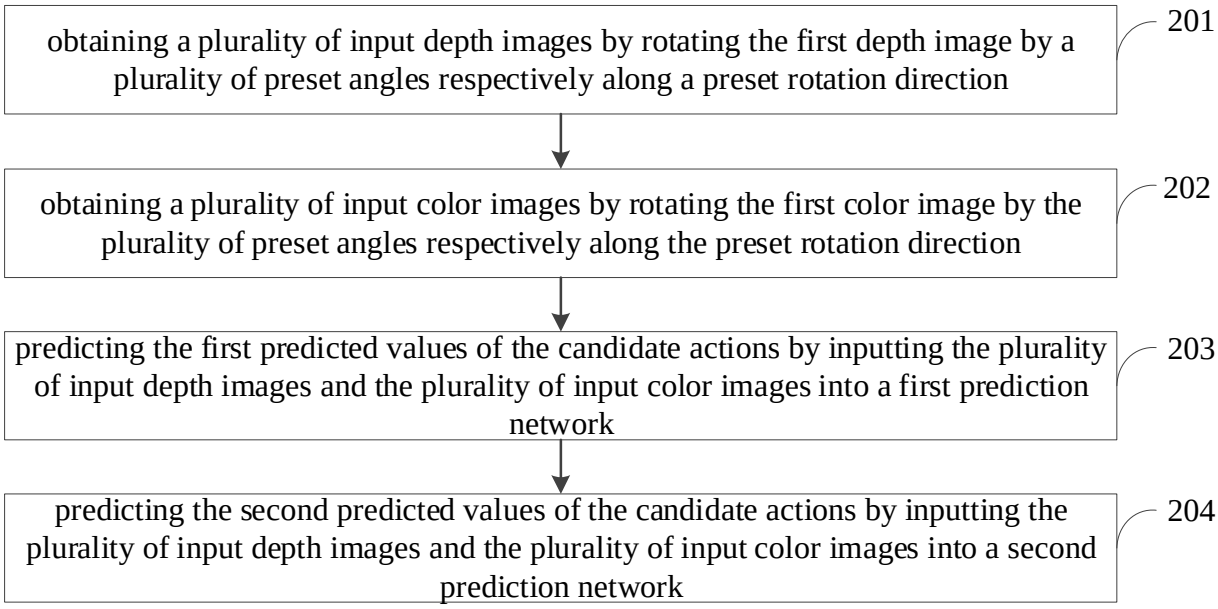

obtaining a plurality of input depth images by rotating the first depth image by a plurality of preset angles respectively along a preset rotation direction
201
obtaining a plurality of input color images by rotating the first color image by the plurality of preset angles respectively along the preset rotation direction
202
predicting the first predicted values of the candidate actions by inputting the plurality of input depth images and the plurality of input color images into a first prediction network
203
predicting the second predicted values of the candidate actions by inputting the plurality of input depth images and the plurality of input color images into a second prediction network
204

FIG. 2

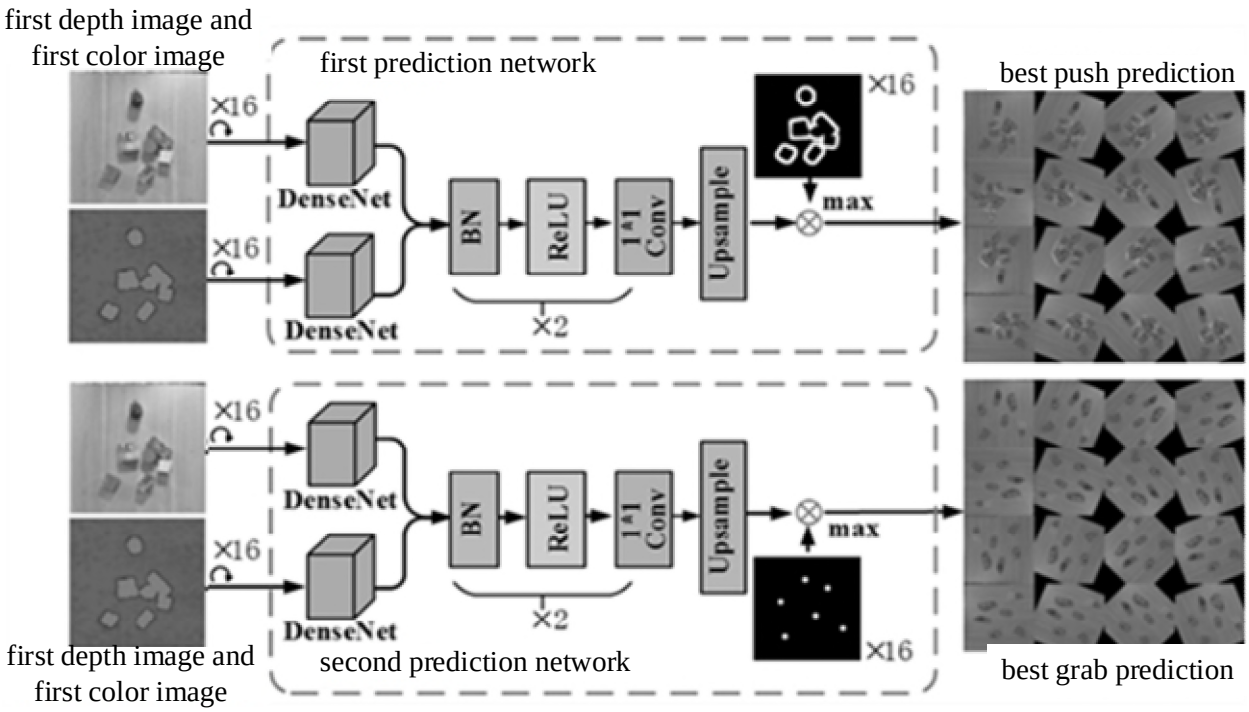

first depth image and first color image
first prediction network
best push prediction
×16
DenseNet
×16
DenseNet
BN
ReLU
1*1 Conv
×2
Upsample
×16
max
first depth image and first color image
second prediction network
best grab prediction

FIG. 3

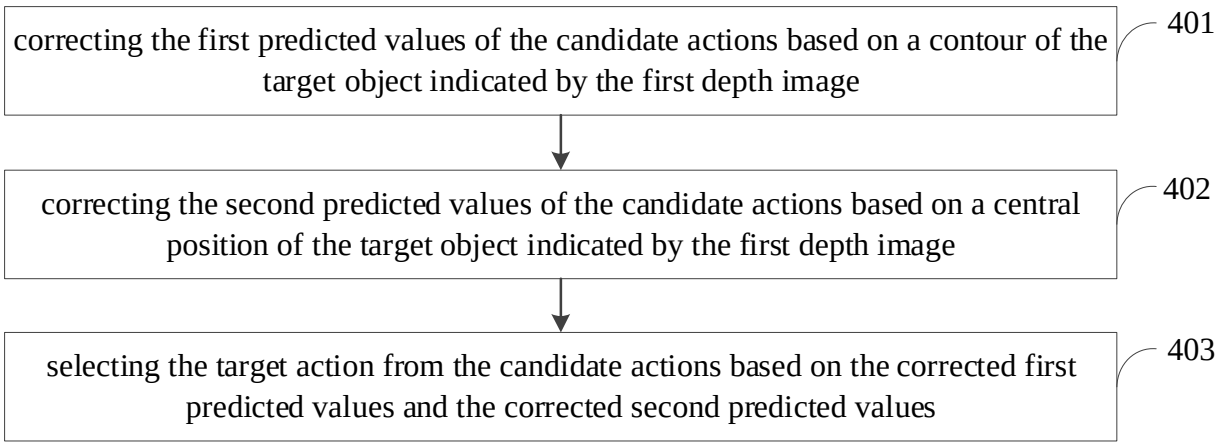

correcting the first predicted values of the candidate actions based on a contour of the target object indicated by the first depth image
401
correcting the second predicted values of the candidate actions based on a central position of the target object indicated by the first depth image
402
selecting the target action from the candidate actions based on the corrected first predicted values and the corrected second predicted values
403

FIG. 4

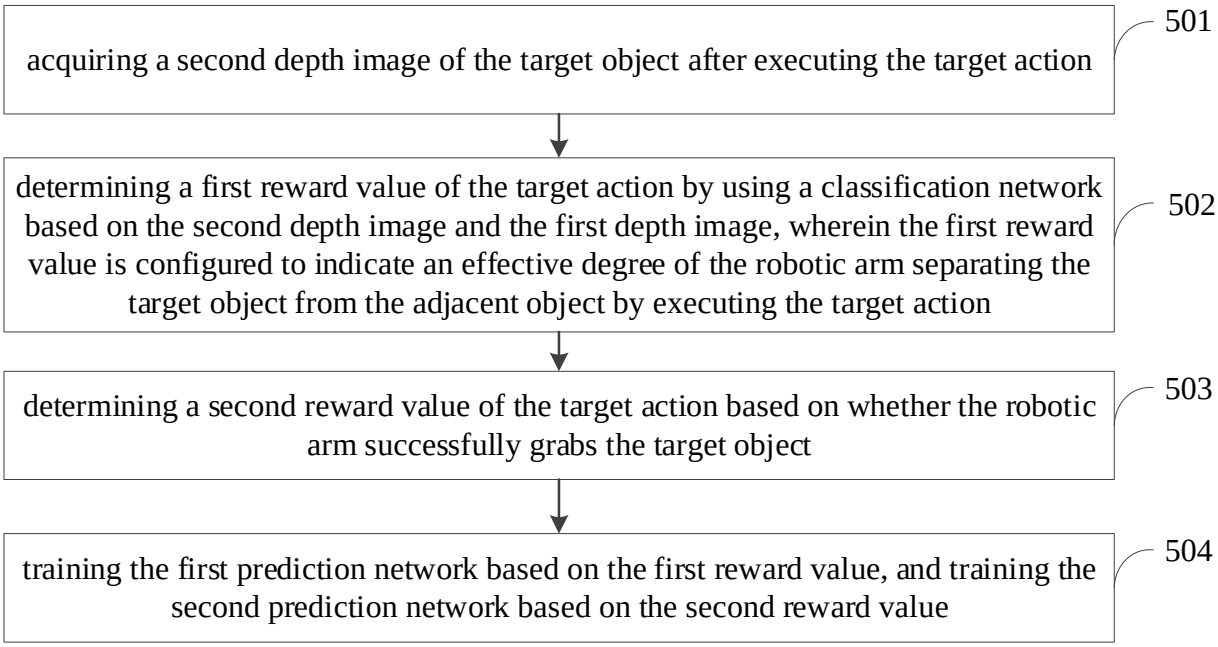

acquiring a second depth image of the target object after executing the target action
501
determining a first reward value of the target action by using a classification network based on the second depth image and the first depth image, wherein the first reward value is configured to indicate an effective degree of the robotic arm separating the target object from the adjacent object by executing the target action
502
determining a second reward value of the target action based on whether the robotic arm successfully grabs the target object
503
training the first prediction network based on the first reward value, and training the second prediction network based on the second reward value
504

FIG. 5

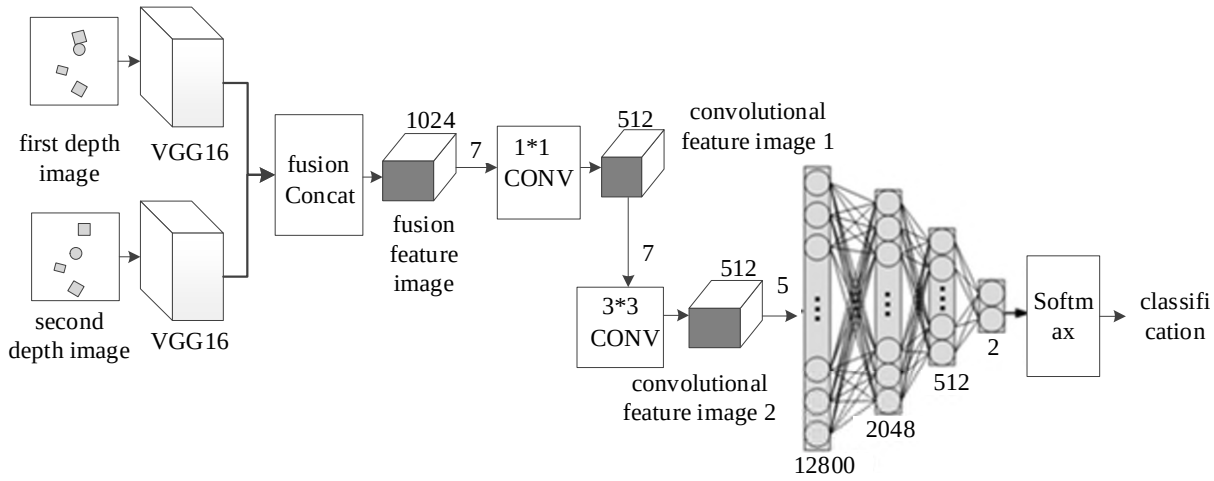

first depth image
VGG16
second depth image
VGG16
fusion Concat
1024
7
fusion feature image
1*1 CONV
512
convolutional feature image 1
7
3*3 CONV
512
5
convolutional feature image 2
12800
2048
512
2
Softmax
classification

FIG. 6

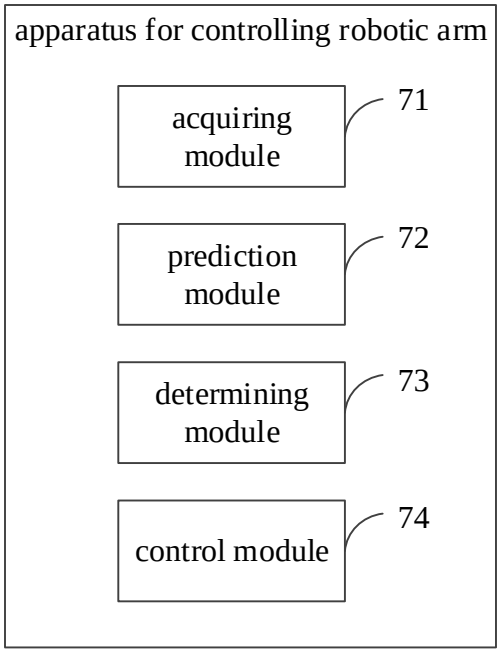

apparatus for controlling robotic arm
acquiring module
71
prediction module
72
determining module
73
control module
74

FIG. 7

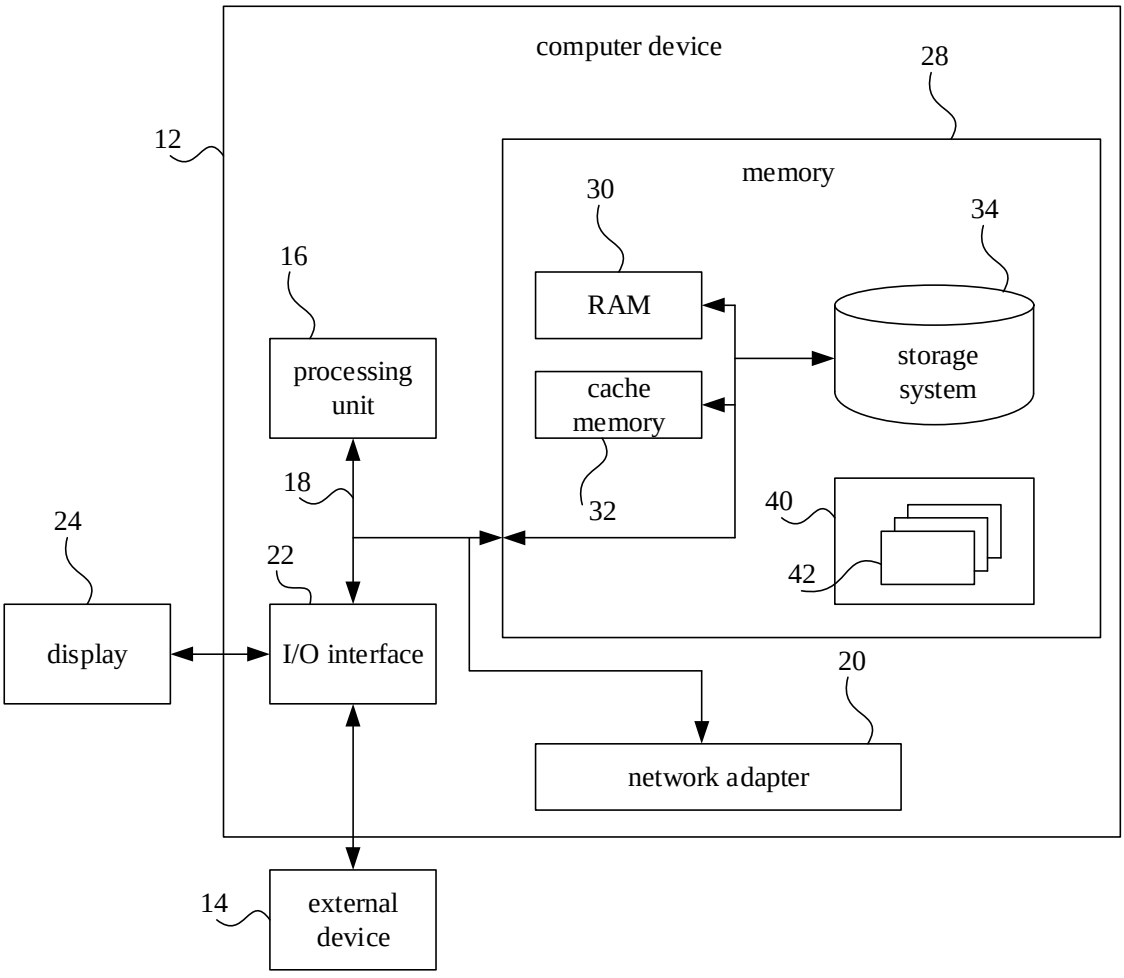

computer device
28
12
memory
30
34
16
RAM
processing unit
storage system
cache memory
18
32
40
24
42
22
display
I/O interface
20
network adapter
14
external device

FIG. 8