CLAIMS

1. A method for training a robot device controller comprising:
training a neural network comprising an encoder network, a decoder network and a policy model, such that, for each of a plurality of digital training input images,
the encoder network encodes the digital training input image to a feature in a latent space;
the decoder network determines, from the feature, for each of a plurality of areas shown in the digital training input image, whether the area is traversable and information about the distance between the viewpoint of the digital training input image and the area in the form of relative depth of the areas;
and the policy model determines, from the feature, control information for controlling movement of a robot device;
wherein at least the policy model is trained in a supervised manner using control information ground truth data of the digital training input images.

2. The method of claim 1, wherein training the encoder network and the decoder network comprises training an autoencoder comprising the encoder network and the decoder network.

3. The method of claim 1 or 2, comprising training the encoder network jointly with the decoder network.

4. The method of any one of claims 1 to 3, comprising training the encoder network jointly with the decoder network and the policy model.

5. The method of any one of claims 1 to 4, wherein the decoder network comprises a semantic decoder and a depth decoder and wherein the neural network is trained such that, for each digital training input image,
the semantic decoder determines, from the feature, for each of a plurality of areas shown in the digital training input image, whether the area is traversable; and

the depth decoder determines, from the one or more features, for each of a plurality of areas shown in the digital training input image, information about the distance between the viewpoint of the digital training input image and the area.

6. The method of claim 5, wherein the semantic decoder is trained in a supervised manner.

7. The method of claim 5, wherein the depth decoder is trained in a supervised manner or wherein the depth decoder is trained in an unsupervised manner.

8. The method of any one of claims 1 to 7, wherein one or more of the encoder network, the decoder network and the policy model are convolutional neural networks.

9. The method of any one of claims 1 to 8, wherein the control information comprises control information for each of a plurality of robot device movement commands.

10. The method of any one of claims 1 to 9, wherein the neural network is trained such that the policy model determines the control information from features to which the encoder has encoded a plurality of training input images.

11. A method for controlling a robot device comprising:

Training a robot device controller according to any one of claims 1 to 10;
obtaining one or more digital images showing surroundings of the robot device;
encoding the one or more digital images to one or more features using the encoder network;
supplying the one or more features to the policy model; and
controlling the robot according to control information output of the policy model in response to the one or more features.

12. The method of claim 11, comprising receiving the one or more digital images from one or more cameras of the robotic device.

13. The method of claim 11 or 12, wherein the control information comprises control information for each of a plurality of robot device movement commands and wherein the method comprises receiving an indication of a robot device movement command and controlling the robot according to the control information for the indicated robot device movement command.

14. The method of any one of claims 11 to 13, wherein the neural network is trained such that the policy model determines the control information from features to which the encoder has encoded a plurality of training input images and wherein the method comprises obtaining a plurality of digital images showing surroundings of the robot device;

encoding the plurality of digital images to a plurality of features using the encoder network;

supplying the plurality of features to the policy model; and

controlling the robot according to control information output of the policy model in response to the plurality of features

15. The method of claim 14, wherein the plurality of digital images comprises images received from different cameras.

16. The method of claim 14 or 15, wherein the plurality of digital images comprises images taken from different viewpoints.

17. The method of any one of claims 14 to 16, wherein the plurality of digital images comprises images taken at different times.

18. A robot device control system configured to perform the method of any one of claims 1 to 17.

19. A computer program element comprising program instructions, which, when executed by one or more processors, cause the one or more processors to perform the method of any one of claims 1 to 17.

20. A computer-readable medium comprising program instructions, which, when executed by one or more processors, cause the one or more processors to perform the method of any one of claims 1 to 17.