受験番号：28IPE008

問 1.

[Claim 1]

A head mount display device comprising:

an image generating unit configured to generate a first image for displaying a first virtual image and a second image as an eye point guidance image for displaying a second virtual image, the second virtual image being adapted to be used in assisting in moving an eye point of a user toward the first virtual image;

an image display unit configured to display the generated first and second images and output display light beams of the first and second images;

a perspective projection optical unit arranged ahead of eyes of the user, the perspective projection optical unit including a first portion and a second portion, the first portion being configured to project the display light beams of the first and second images onto the eyes of the user, the second portion being adapted to allow the user to see through a real view; and

a control unit configured to control the image generating unit.

[Claim 4]

The head mount display device according to any one of claims 1 to 3,

wherein:

the second virtual image is displayed near the first virtual image on a virtual image display screen for the first virtual image, and

the second virtual image is a virtual image of an eye point guidance object serving as the eye point guidance image, at least one of a color, luminance, or a position on the virtual image display screen of the eye point guidance object being adapted to change with time.

[Claim 5]

The head mount display device according to claim 4, wherein when the position on the virtual image display screen of the eye point guidance object changes, provided that a front direction of the user is a first direction, a left-right direction that is orthogonal to the first direction and is along a line segment connecting left and right eyes of the user is a second direction, and an up-down direction that is orthogonal to each of the first and second directions and is along a vertical line is a third direction, the control unit is configured to move the second virtual image along a part of an arc that is

line-symmetrical in the second direction so that positions of the second virtual image in both the second direction and the third direction change on the virtual image display screen.

問 2.

Conventionally, there is known an energy charge and discharge system that supplies power to a household load from a storage battery of an electric vehicle or charges a storage battery of an electric vehicle from a commercial power supply for household use.

When charging a storage battery of an electric vehicle from a commercial power supply, the conventional charge and discharge system performs charging by converting an AC voltage into a predetermined DC voltage using a power conditioner for electric vehicles provided as home equipment, that is, converting AC power into DC power. Conversely, when supplying power to a household load from a storage battery of an electric vehicle, the conventional charge and discharge system supplies power to the household load by converting a DC voltage (DC power) output from the storage battery of the electric vehicle into an AC voltage (AC power) using the power conditioner for electric vehicles. As an energy charge and discharge system having such a power conditioner for electric vehicles, a charge and discharge system disclosed in Patent Literature 1 is known, for example.

When the power conditioner for electric vehicles, which is used in the conventional charge and discharge system having a function of charging storage batteries of electric vehicles, is caused to execute a discharge operation of releasing a DC voltage from a storage battery of an electric vehicle, the power conditioner for electric vehicles first executes a communication process with an electric vehicle, and establishment of the communication process is used as a requirement to start the aforementioned discharge operation for the following reasons. Therefore, when the communication process fails, the discharge operation cannot be executed.

The establishment of the communication process is used as a requirement to start the discharge operation because if a voltage is applied across the charge and discharge terminals of the electric vehicle without the establishment of the communication process, there is a risk that dangerous conditions, such as electric shocks, may occur.

問 3.

(A)

One of the problems of the gradient descent method lies in its difficulty in selecting the learning rate. For example, selecting a low learning rate cannot improve the accuracy (i.e., correct rate or errors) soon, and thus results in a long learning process. Meanwhile, setting a high learning rate can expedite the progress of the initial learning and thus can shorten the time until a given accuracy level is reached. However, there is a possibility that the learning may fail during the course of the process, which can result in significantly decreased (deteriorated) accuracy, and the accuracy may remain unimproved in some cases.
(A')

(B)

In addition, there are also cases where the accuracy of DNN significantly improves in the initial stage of learning, but then deteriorates gradually. Even in such a case, reselecting the learning rate may be able to avoid such a circumstance.

Fig. 6 illustrates the problems of the gradient descent method. A curved line of an error E in Fig. 6 is the same as that in Fig. 5, but in the example of Fig. 6, the learning rate η is set higher than that in Fig. 5 and is also constant. In Fig. 6, symbol t indicates the time of the learning cycle, and symbol W at each time t indicates the weight at the time t. The curved line of the error E in Fig. 6 includes a point at which the error E is the minimum (weight W_{min}) and a point at which the error E is ultrasmall (weight W_{local}), though it is not minimum. A target weight is the weight W_{min} for minimizing the error E, and the weight W_{local} is the weight for bringing the error E into the local solution. Minimizing the error E corresponds to maximizing the output accuracy of DNN. In DNN in which the initial weight W_1 at time t = 1 is set, the gradient $\partial E/\partial w$ is negative and the absolute value is large. Therefore, the updated weight W_2 greatly shifts in the positive direction (rightward), and the error function $E(W_2)$ also decreases significantly.
(B')