Patent claims

Claim 1:

An apparatus for operating a simulator with a special impression of reality for learning how to control a vehicle, in particular an aircraft, moving in three-dimensional reality,

characterized in that said apparatus has the following features:

a) a vehicle cab (4) modeled on the vehicle to be simulated and having real operator control elements is connected, on the one hand, to a 6-axis industrial robot (1) and, on the other hand, to the ground via a device (6) for translatory lateral movement which is movably mounted at a right angle on a device (5) for translatory longitudinal movement,

b) a display modeled on the contours of the vehicle cab (4) serves to transmit a simulated external view on the basis of OLED technology,

c) for the purposes of simulating hazardous situations which occur in practice, controllable systems for artificially producing smoke (12), shaking movements, sound generation and light phenomena (14) are provided,

d) for detecting human stress reactions, controllable systems for sensing the resistance (10) of the skin and for detecting movements of persons and physiognomy (16) are provided,

e) a sensor (17) for detecting the actual movements of the vehicle cab,

f) a system for externally operating and controlling the simulator, which system also registers the reactions of a fight trainer.

Claim 2:

The apparatus for operating a simulator as claimed in claim 1,
characterized
in that in order to transmit a simulated external view, instead of the OLED technology according to feature b) a display is used which is projected by means of projectors onto projection surfaces which are located outside the aircraft cockpit (4).

Claim 3:

The apparatus as claimed in one of the preceding claims,
characterized
in that the operator control panel of the aircraft cabin (4) which is used can be quickly adapted to the respectively simulated aircraft type, in an easily exchangeable fashion, by means of the module system (13).

Claim 4:

The apparatus as claimed in one of the preceding claims,
characterized
in that for the purpose of training, in particular helicopter pilots, a further projection surface which maps the ground area is also provided, and in that the aircraft cockpit 4 is equipped with a transparent floor panel.

Claim 5:

The apparatus as claimed in one of the preceding claims,
characterized
in that for the purpose of training in the military field for simulating hazardous situations which occur in practice, parameters which are relevant in terms of military technology, of an acoustic, optical and mechanical nature, are provided in the training program.

Claim 6:

A method for operating a simulator with a special impression of reality for learning how to control a vehicle, in particular an aircraft, moving in three-dimensional reality,

characterized in that it has the following features:

a) a vehicle cab (4) modeled on the vehicle to be simulated and having real operator control elements can be moved by means of an external operator control unit by means of a 6-axis industrial robot (1) which can be moved in two orthogonal directions on the ground,
b) a simulated external view is conveyed to the flight trainer by means of a display using OLED technology instead of the normally transparent aircraft cockpit,
c) for the purposes of simulating hazardous situations which occur in practice, controllable systems for artificially producing smoke (12), shaking movements, sound generation and light phenomena (14) are provided,
d) for detecting human stress reactions, controllable systems for sensing the

resistance (10) of the skin and detecting movements of persons and the physiognomy (16) are provided, and

e) the operator control panel used can be quickly adapted to the respectively simulated aircraft type by means of a module system (13).

Claim 7

The method as claimed in claim 1, characterized in that in order to convey a simulated external view, instead of the OLED technology according to feature b) a display is used which is projected by means of projectors onto projection surfaces which are located outside the aircraft cockpit (4).

Claim 8:

A computer program having a program code for implementing the method steps as claimed in one of claims 6 and 7 when the program is running in a computer.

Claim 9:

A machine-readable carrier having the program code of a computer program for implementing the method as claimed in one of claims 6 and 7 when the program is running in a computer.

Claims

Claim 1:

An apparatus for operating a simulator for learning how to control a vehicle, in particular an aircraft, moving in three-dimensional reality,

characterized in that said apparatus has the following features:

a) a vehicle cab (4) modeled on the vehicle to be simulated and having real operator control elements is connected to a 6-axis industrial robot (1) and to the ground via a device (6) for translatory lateral movement which is movably mounted at a right angle on a device (5) for translatory longitudinal movement,

b) a display modeled on the contours of the vehicle cab (4) serves to transmit a simulated external view,

c) controllable systems for artificially producing smoke (12), shaking movements, sound generation and light phenomena (14),

d) controllable systems for sensing the resistance (10) of the skin and for detecting movements of persons and physiognomy (16),

e) a sensor (17) for detecting the actual movements of the vehicle cab,

f) a system for externally operating and controlling the simulator, which system also registers the reactions of a fight trainer.

Claim 2:

The apparatus for operating a simulator according to claim 1,
Characterized in that the means for transmitting a simulated external view uses organic light emitting diode technology.

Claim 3:

The apparatus for operating a simulator as claimed in claim 1,
characterized
in that the means for transmitting a simulated external view, projects a display by means of projectors onto projection surfaces which are located outside the vehicle cab (4).

Claim 4:

The apparatus as claimed in one of the preceding claims,
characterized
in that an operator control panel of the vehicle cab (4) can be adapted to the respectively simulated aircraft type, in an exchangeable fashion, by means of the module system (13).

Claim 5:

The apparatus as claimed in one of the preceding claims,
characterized
in that for the purpose of training, in particular helicopter pilots, a further projection surface which maps the ground area is also provided, and in that the vehicle cab 4 is equipped with a transparent floor panel.

Claim 6:

The apparatus as claimed in one of the preceding claims,
characterized
in that parameters which are relevant in terms of military technology, of an acoustic, optical and mechanical nature, are provided in a training program.

Claim 7:

A method for operating a simulator for learning how to control a vehicle, in particular an aircraft, moving in three-dimensional reality,

characterized in that it has the following features:

a) a vehicle cab (4) modeled on the vehicle to be simulated and having real operator control elements can be moved by means of an external operator control unit by means of a 6-axis industrial robot (1) which can be moved in two orthogonal directions on the ground,
b) a simulated external view is conveyed to a flight trainer
c) controllable systems for artificially producing smoke (12), shaking movements, sound generation and light phenomena (14),
d) controllable systems for sensing the resistance (10) of the skin and detecting movements of persons and the physiognomy (16) are provided, and
e) the operator control panel used can be quickly adapted to the respectively

simulated aircraft type by means of a module system (13).

Claim 8:

The method as claimed in claim 7 characterized in that the simulated external view is conveyed to a flight trainer by means of a display using organic light emitting diode technology.

Claim 9

The method as claimed in claim 7, characterized
the simulated external view is conveyed to a flight trainer using a display which is projected by means of projectors onto projection surfaces which are located outside the aircraft cockpit (4).

Claim 10:

A computer program having a program code for implementing the method steps as claimed in one of claims 7, 8 and 9 when the program is running in a computer.

Claim 11:

A machine-readable carrier having the program code of a computer program for implementing the method as claimed in one of claims 7, 8, 9 or 10 when the program is running in a computer.