

Claims

1. System comprising a smart vehicle seat (1) having a seat base (1b) and a backrest (1c), the surfaces of which are provided with flat pressure sensors, the pressure sensors being connected to a microcontroller (6) via which an actuator element is controllable via a drive unit (9), whereby the actuator element is adapted to change the surface of the seat base (1b) and/or the backrest (1c),

characterized in that

the actuator element comprises one or more valves (9) via which one or more airbags (10) are controllable.

2. System according to claim 1, characterized in that the airbags (10) in the seat base (1b) and in the backrest (1c) are integrated below the surface.

3. System according to any one of the preceding claims, characterized in that the pressure sensors are designed as graphene sensor arrays.

4. System according to any one of the preceding claims, characterized in that the graphene sensor arrays consist of a plurality of sensor elements (3), wherein in each sensor element (3) graphene strip conductors (4) are arranged on a substrate (5).

5. System according to claim 4, characterized in that each single sensor element (3) is smaller than 0.5 mm^2 , preferably smaller than 0.37 mm^2 .

6. System according to any one of the preceding claims, characterized in that an artificial intelligence module (7) is integrated in the microcontroller (6).

7. A method for controlling a system of a smart vehicle seat (1), in which

- the pressure distribution on the surface of the vehicle seat (1) is measured by means of pressure sensors,

- the measurement data are forwarded to a microcontroller (6),
- the microcontroller determines the sitting posture (P_1, P_2, P_3, P_4) on the basis of the measured data and learned knowledge using an artificial intelligence module (7)
- and controls via valves (9) an actuator element according the sitting posture (P_1, P_2, P_3, P_4) .

8. The method according to claim 7, characterized in that the learned knowledge is based on a record which is processed by means of a recurrent neural network (RNN) and the sitting posture (P_1, P_2, P_3, P_4) is determined by means of the Softmax-function.

9. The method according to claim 8, characterized in that data input of the recurrent neural network (RNN) is encoded by a convolutional neural network (CNN).

10. The method according to one of claims 7-9, characterized in that the sitting posture (P_1, P_2, P_3, P_4) and/or the actuator settings are retrieved and/or set via a human-machine-interface (HMI).

11. The method according to any one of claims 8-10, characterized in that the actuator element comprises airbags (10) integrated in the smart vehicle seat (1), wherein the valves (9) control the individual pressure in each airbag (10).