**WHAT IS CLAIMED IS:**

1. A battery capacity variable control apparatus including:

a sensor unit configured to measure an electrical characteristic value of a battery to output real SOC information of the battery;

an input unit electrically connected to the sensor unit and configured to set a capacity limit rate of the battery based on the real SOC information output by the sensor unit; and

a control unit electrically connected to the input unit and configured to selectively vary a use region where the battery is charged or discharged according to the capacity limit rate set by the input unit to output virtual setting SOC information, and to set a usage of the battery according to the virtual setting SOC information,

wherein the control unit is configured to selectively set upper limit SOC information and lower limit SOC information of the battery according to the capacity limit rate, and

wherein the virtual setting SOC information is set by excluding the upper limit SOC information and the lower limit SOC information from a reference SOC information,

wherein in response that a driving of a vehicle in a preset emergency traveling mode is requested by a driver's input, the control unit is configured to determine whether the vehicle is driven in the emergency traveling mode, and when the vehicle is driven in the emergency traveling mode, the lower limit SOC information is included in the virtual setting SOC information.

2. The battery capacity variable control apparatus of claim 1,

wherein when having determined that the vehicle is not in the emergency traveling mode, the control unit is configured to output a traveling distance of the vehicle, a traveling strategy of the vehicle, and charging control information of the battery based on the virtual setting SOC information.

3. The battery capacity variable control apparatus of claim 1 or claim 2,

wherein the input unit is configured to set the capacity limit rate by a driver's input based on the real SOC information, or to set the capacity limit rate by an input of a certified diagnosis device.

4. The battery capacity variable control apparatus of any one of claims 1 to 3,

wherein the input unit is configured to receive information from a database in which an operation pattern and charging and discharging patterns of the battery are stored, and is configured to analyze the operation pattern and the charging and discharging patterns to set the capacity limit rate.

5. A battery capacity variable control method including:

outputting, by a sensor unit, real SOC information of a battery by measuring an electrical characteristic value of the battery;

setting, by an input unit electrically connected to the sensor unit, a capacity limit rate of the battery, based on the real SOC information output by the sensor unit; and

outputting, by a control unit electrically connected to the input unit, virtual setting SOC information by selectively varying a use region where the battery is charged or discharged, based on the capacity limit rate set by the input unit,

wherein when a driving request in a preset emergency traveling mode according to a driver's input is delivered, the outputting of the virtual setting SOC information includes determining, by the control unit, whether a vehicle is driven in the emergency traveling mode,

wherein the outputting of the virtual setting SOC information includes selectively setting, by the control unit, upper limit SOC information and lower limit SOC information of the battery according to the capacitive limit rate, and

wherein the virtual setting SOC information is set by excluding the upper limit SOC information and the lower limit SOC information from a reference SOC information,

wherein in the determining of the emergency traveling mode, when the control unit concludes that the vehicle is in the emergency traveling mode, the lower limit SOC information is included in the virtual setting SOC information.

6. The battery capacity variable control method of claim 5,

wherein when having determined that the vehicle is not in the emergency traveling mode, the control unit is configured to output a traveling distance of the vehicle, a traveling strategy of the vehicle, and charging control information of the battery based on the virtual setting SOC information.

7. The battery capacity variable control method of claim 5,

wherein the input unit is configured to set the capacity limit rate by a driver's input based on the real SOC information, or to set the capacity limit rate by an input of a certified diagnosis device.

8. The battery capacity variable control method of any one of claims 5 to 7,

wherein the input unit is configured to receive information from a database in which an operation pattern and charging and discharging patterns of the battery are stored, and is configured to analyze the operation pattern and the charging and discharging patterns to set the capacity limit rate.

9. A non-transitory computer readable storage medium on which a program for performing the battery capacity variable control method of any one of claims 5 to 8 is recorded.