CLAIMS

1. An apparatus comprising:

a frame (100);

a front wheel (200) and a rear wheel (210) coupled to the frame;

at least two gyroscopes (260) coupled to the frame, each gyroscope to include a flywheel (270a, 270b);

characterized in that said apparatus further comprises:

a plurality of sensors (560, 570, 580, 590) to detect orientation of the frame, orientation of the front wheel with respect to the frame, orientation and rotational speed of the flywheels, and speed of the apparatus; and

an electronic control system (550, 551, 553, 554) to adjust at least one of the orientation and rotational speed of at least one of the flywheels based, at least in part, on data from the plurality of sensors and an input to change at least one of speed and direction of the apparatus.

2. The apparatus of claim 1, wherein the input to change the direction of the apparatus comprises an input to change the orientation of the front wheel with respect to the frame, and the electronic control system to adjust the at least one of the orientation and rotational speed of at least one of the flywheels to maintain stability during a turn.

3. The apparatus of claim 1, the electronic control system to reduce the speed of the flywheel(s) when the input comprises an input to increase the speed of the apparatus.

4. The apparatus of claim 1, further comprising a braking system (190) to reduce the speed of at least one of the front and rear wheels, wherein the input to change speed of the apparatus comprises an input to engage the braking system, the electronic control system to increase the speed of the flywheel to increase stability influence.

5. The apparatus of claim 1, the at least two gyroscopes aligned lengthwise with respect to the front and rear wheel.

6. The apparatus of claim 5, the at least two flywheels to spin and precess in opposite directions with respect to each other.

7. The apparatus of claim 1, the at least two gyroscopes aligned at least one of widthwise with respect to the frame of the vehicle, and heightwise with respect to the frame of the vehicle.

8. The apparatus of claim 1, the at least two flywheels to be of equal size.

9. The apparatus of claim 1, the at least two flywheels to each comprise at least one of carbon fiber, Kevlar, steel, brass, bronze, lead and depleted uranium.

10. The apparatus of claim 1, the at least two gyroscopes coupled to the frame via a first and second set of gimbal mountings respectively.

11. A system comprising:

at least one a processor (550, 551, 553, 554);

a memory (550, 551, 553, 554); and

a control module (550, 551, 553, 554) stored in the memory and executed via the processor to

receive data from a plurality of sensors (506, 570, 580, 590) indicating orientation of a frame of a vehicle (100), orientation of a front wheel (200) of the vehicle with respect to the frame, ~~orientation and rotational speed of a flywheel included in a gyroscope coupled to the frame,~~ and speed of the frame,

characterized in that

the control module is to

receive data from a plurality of sensors (506, 570, 580, 590) indicating orientation and rotational speed of a flywheel (270a, 270b) included in a gyroscope (260) coupled to the frame,

receive input to change at least one of speed and direction of the vehicle,

determine a vehicle state (556) based, at least in part, on the received data, and

adjust at least one of the orientation and rotational speed of the flywheel based, at least in part, on the vehicle state.

~~12. The system of claim 11, the control module to further receive input to change at least one of speed and direction of the vehicle, and~~

adjust at least one of the orientation and rotational speed of the flywheel further based, at least in part, on the input to change at least one of speed and direction of the vehicle.

~~13.~~12. The system of claim ~~12~~11, the control module to further

determine an intended vehicle state based, at least in part, on the received input, and

adjust at least one of the orientation and rotational speed of the flywheel based, at least in part, on the intended vehicle state.

~~14.~~13. The system of claim ~~13~~12, wherein the received input comprises a command to turn the front wheel, the intended vehicle state to comprise a turn, the control module to adjust the orientation and rotational speed of the flywheel to maintain stability during the turn.

~~15.~~14. The system of 11 further comprising:

a flywheel motor-generator control module (553) to control the flywheel of the gyroscope and to operate in a motor mode and a generator mode, wherein the motor mode comprises transferring electrical current to the gyroscope to change at least one of the orientation and rotational speed of the flywheel, and the generator mode comprises transferring electrical current generated by flywheel from the gyroscope.

~~16.~~15. The system of claim 11, further comprising

a drive wheel motor-generator control module (440) to control at least one of the front and rear wheel of the vehicle and to operate in a motor mode and a generator mode, wherein the motor mode comprises receiving electrical current to the rotational speed of the respective wheel, and generator mode comprises transferring electrical current generated by the respective wheel.

~~17.~~16. A system comprising:

a drive wheel motor-generator (220, 230) to transfer energy to and from a drive wheel of a vehicle;

a flywheel motor-generator (280a, 280b) to transfer energy to and from a flywheel included in a gyroscope-stabilizer of the vehicle;

characterized in that the system further comprises:

a capacitor bank (430) including a battery (420); and

a power controller (440) to

transfer energy from the flywheel motor-generator to the capacitor bank in response to detecting an input to increase the speed of the vehicle, and

transfer energy from the drive wheel motor-generator to the capacitor bank in response to detecting an input to decrease the speed of the vehicle.

~~18.~~17. The system of claim ~~17~~16, the power controller to further:

transfer energy from the capacitor bank to the drive wheel motor-generator in response to detecting the input to increase the speed of the vehicle, and

transfer energy from the capacitor bank to the flywheel motor-generator in response to detecting the input to decrease the speed of the vehicle.

~~19.~~18. The system of claim ~~18~~17, the power controller to

transfer energy not required by the drive-wheel motor to at least one of the capacitor bank and the battery in response to detecting an input to increase the speed of the vehicle, and

transfer energy not required by the flywheel to at least one of the capacitor bank and the battery in response to detecting an input to decrease the speed of the vehicle.

~~20.~~19. The system of claim ~~17~~16, the input to decrease the speed of the vehicle comprises an input to engage a braking system (190) of the vehicle, the braking system to generate energy transferrable from the drive wheel motor-generator.

~~21.~~20. The system of claim ~~17~~16, the power controller to further transfer energy from the capacitor bank to the flywheel motor-generator based, at least in part, on whether the speed of the vehicle will affect stability of the vehicle.

~~22.~~21. The system of claim ~~17~~16, the power controller to further

determine the input to decrease the speed of the vehicle will affect stability of the vehicle; and

transfer energy from the capacitor bank to the flywheel motor-generator in response to determining the input to decrease the speed of the vehicle will affect stability of the vehicle.