Applications

Starwars BB8 model has varied applications, it’s implementation scale can be pitched from a all terrain vehicle to a space rover. The robot can be used for navigation, patrolling, communication and other purposes. The best part of our robot is that it will never topple, this tragedy occurred with Mars rover “Discovery” which toppled and suffered serious complications. Coming on navigation part , since the robot’s movement mechanism is based on shifting of COG of the body inside the outer sphere and the contact area is almost equivalent in all surfaces hence the robot can easily navigate maneuvering different kinds of surfaces.

The head of the BB8 model is detachable , hence it can be used to install various kinds of plug-ins like a communication enhancing network creation antennae can be installed in the head , a camera assemble can be embedded in the head which can help in patrolling remote areas and also for spying purposes since the size of the robot can be varied according to the need.

WORKING

The robot comprises of 3 parts:-

1- Head Assembly

2- Outer Sphere

3- Internal Mechanism

HEAD ASSEMBLY

Head assembly comprises of a semi spherical thermocol shell. Inside the shell was installed an assembly of magnets and castor wheels. These magnets were paired with the magnets placed on the top of the internal mechnism. When the internal body rotates it’s top using a DC motor,the paired magnets make the top move accordingly.

OUTER SPHERE

Outer Sphere is the surface contact part of the bot . It contains the internal mechanism which moves inside it to shift centre of gravity of the bot and once the COG shifts from the base , the system becomes unbalanced and the Outer sphere moves in the same direction to normalize this change and reduce system’s potential energy.

INTERNAL MECHANISM

The internal mechanism comprises of a circular base and differential drive. The internal mechanism has low center of gravity (added weight) .The drive consists of two traction wheels paired on two DC motors . The mechanism moves inside the outer sphere and climbs the wall of the sphere. A net torque is applied on the center of mass of the system and the outer sphere rolls in the same direction to lower the internal mechanism. To change the direction of motion, the wheels are rotated in opposite direction while the bot remains stationary , the internal mechanism aligns itself into different direction.