

Self-balancing robot

Abstract :

Technology is provided for a self-balancing robot that transitions from a three-wheeled mode to a two-wheeled self-balancing mode. The robot includes a body and a pair of drive wheels located at a first end portion of the body. Each drive wheel is coupled to a drive assembly operative to propel the robot along a surface. A third wheel is located on the body at a second end portion opposite the first end portion. A main arm is coupled to the body, wherein the main arm is rotatable to confront the surface and lift the third wheel away from the surface, thereby standing the body up onto the pair of drive wheels in preparation for self-balancing.

Work done in this feild :

- Self balancing robot that is capable of adjusting itself with respect to changes in weight and position. We developed the Balance System from a single gyroscope and a single accelerometer.

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- Two-wheeled self-balancing robot is a non-stable, non-linear, strong coupling system. On the basis of building up the system structure model, kinetic equation is built up by using the **Lagrange's method**, then obtaining the linearizing model in the vicinity of the balance. The control method of combining LQR and PID.

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- self-balancing robot design ibased on an [inverted pendulum](#), which is a pendulum with its center of mass above the pivot point. Balancing an inverted pendulum is a challenge, because it is inherently unstable.

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