USAIN BOT

(A BIPED)

ABSTRACT

We are making a biped with four degrees of freedom which can walk forward, backward and rotate about its axis.

so the basic idea goes like this-
our basic aim is to ensure stability while walking i.e. to maintain the COPs at the center of the foot. our walking mechanism is a simple 2 step process!
firstly, we tilt the resting leg using the ankle servo till the COM of the system lies above the center of the resting foot. this automatically lifts the other leg in the process. Now, using the servo in the torso region of the resting leg, we will rotate the body about this leg so that the lifted leg moves forward (and automatically falls due to the shift in COM). thus, a step is taken and now, the process continues! as we are rotating the lifted leg, we can rotate the biped by one step taken forward and the other backwards.

we have planned the following timeline-

1st week-
#learn solid works, make a rough sketch of the model
estimate the torque of the servos required using the model, and the battery/adapter needed
#bring the materials required.

2nd week-
#make the model in solid works and make different parts of the model (the servo brackets) using the materials.

3rd week-
#assemble the parts, checking the servos.

4th week-
#coding in arduino and getting the angle of tilt.

5th & 6th week-
#attempting to make it wireless (controlling using pc)

Cost estimate(approx.)-
4 servo motors- Rs. 500X4 = Rs.2000
small arduino board- Rs. 800
adaptor(as we are using as power source)- Rs. 1000
materials(aluminium/acrylic etc.)- Rs. 200
xbee arduino (to make it wireless)- Rs. 3000
total estimated cost- Rs. 7000

What do we learn?
we get to learn solidworks, a bit of coding (arduino board), a taste of applying the systems and controlling it. we learn applied mechanics, some practicality on how to put mechanics on use.
and this is what we can think of, right now…. hopefully we get to learn much more than this!