It all started with a letter handed out to me by my science teacher in Class 8, asking me to participate in a competition he had come across. I went through the requirements and found myself inept to complete a 4000-word thesis on an original research that would be of some use to mankind. I gently refused and carried on with my regular routine.

Two years from then, hovering over the morning newspaper I saw an announcement that reminded me of the letter my science teacher had given me in Class 8. This time, however, I decided it would be worth to try!

One day, while browsing the Internet, I found a device called Foucault’s Pendulum. It is a regular pendulum except that it changes its axis of oscillation over time. This rate of change of axis is dependent upon latitude. It was then that this idea of a GPS System that works without satellite - by using this unusual property of the Foucault’s Pendulum - stuck me.

As latitude alone would not be meaningful, the next challenge was to find longitudinal co-ordinates. But the problem that lay before me was that although latitude is a natural system of classification, based on different angles at which gravity acts with respect to the center of the earth and the different radii of circles formed thereby, the system of longitudes is not natural. There is nothing to distinguish one longitude from another based on natural properties. It is rather a man-made system devised for convenience.

As it was not possible to measure longitude directly, I decided to look into the options for positioning in a spherical system. I realized that it is not just latitude and longitude that can determine one’s position. Intersection of any two unique circles on a sphere would represent a position. Keeping this in mind, I thought of other geological properties that are affected by one’s location and then I hit upon the concept of the Earth’s magnetism.

The conventional GPS System does not work at remote locations or in dense forests and shadows of mountains and tall buildings. These signals can also be jammed very easily. This Stand-Alone GPS System would work at any and all places regardless of terrain, remoteness or jamming.
because of the much greater artificial magnetic field around us, which would greatly change the intensity reading. So I used a dip needle for locating the particular isoclinic line (circle around the magnetic north) the device is on. This would intersect with the latitude to make the device locate itself.

Now that my working principles were clear, I had to design a model for all this to work. Although making of a design and selection of a chassis seem to be simple tasks, they are much tougher in reality, especially with cost constraints involved. I decided to make the chassis out of wood and cover the electronic parts with glass. I put adjustment screws at the bottom of the device to enable the user to set the system as per the incline of the ground. I submitted this project as an entry for the CSIR Innovation Award for School Children.

Months from then, although I was waiting eagerly for the results, I did not expect to receive any award. Eventually, on 4 January 2012, when I finally saw the results, I was joyfully surprised that I won the second prize.

The award ceremony on 26 September 2012 was mesmerizing. When I finally received the award from Prof. C.N.R. Rao, I felt the satisfaction that is felt when one is appreciated for a work one has done with full engrossment of mind, body and soul.

Earlier, navigation used tools like observation of stars that were very unreliable. Then the advent of compass and sextant brought in much better capacities for exploration and navigation. In the modern age, the best navigation tool has been the Global Positioning System. It is used by travelers, drivers, explorers and armed personnel for navigational purposes. Of recent, it is also used by pilots, sailors and geologists.

But the conventional GPS System does not work at remote locations or in dense forests and shadows of mountains and tall buildings. These signals can also be jammed very easily. So I have made a Stand-Alone GPS System that would work at any and all places regardless of terrain, remoteness or jamming. I suppose it is complementary to the regular satellite-based GPS System.

I realize that my device is bulky, not user friendly and inaccurate in the present stage. But so was the computer at the time it was invented; only over the years it was developed and perfected. All scientific ideas are like this, they need to be raised and nurtured like a baby before they grow. I would like to encourage the reader to relish and appreciate all ideas he comes across, whether his or someone else’s and not discard them, regardless of how wild or simple it seems.