

GPS NAVIGATOR

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PROJECT INSIGHT

We are trying to make an electronic device which receives gps signals for the purpose of determining the present location.

COMPONENTS USED

- *Atmega 32
- *Atmega 16
- *GPS chipset (SR-91)
- *Graphical LCD (JHD12864E)
- *Flash memory (EN29f040a)

ALGORITHMS USED

*Creating and displaying map:

Creating a monochromatic map of campus of iit kanpur using photoshop.

Convert it into bmp format and checking it using matlab.

Using LCD ASSISTANT to convert the segments into hex files and feeding the data into flash memory in cycles.

Use text feature to display places on map.

*Displaying position on map:

Using Google Maps as a reference got the degree change per pixel traversal separately along latitude and longitude. After getting the latitude and longitude from the GPS chipset we can calculate the number of pixels to be moved. Use pixel coordinates to access flash and show it on the display. If we set the initial offset then we can use the change in degree to calculate the

number of pixels to be traversed.

*Finding shortest route:

If both are connected by a straight line it's the route. Otherwise using the vector most oriented towards target we get the paths joining the two points. After reaching the target we again use the same algorithm to reach the initial point giving us two routes. Usually one of them is the shortest. Using number of pixels traversed to measure the length of the path. User can specify starting and destination points from a menu of places or using pointer.

*Scrolling and Zoom:

The memory mapped is shifted using arrow keys. In maximum zoomed in condition one to one mapping occurs from memory to pixel of screen. While zooming out many to one mapping takes place from memory to pixel of screen.

PROJECT ACHIEVEMENTS

We are able to locate the current position of the navigator in open locations of the campus and display it on the map. Zoom(1x and 9x) function has been implemented. Shortest route code is done and verified on computer but not yet to be implemented in the project.

ACKNOWLEDGEMENT

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Notes and References

The AVRLIB library used for the graphical LCD screen and the EEPROM chip can be found at: <http://www.mil.ufl.edu/~chrisarnold/components/microcontrollerBoard/AVR/avrlib/>. The code for Flash memory (EN29f040a) is available in the tutorials page of Eclub,s website.

Future Prospects

Project can be developed to be implement realtime automatic navigation of vehicles.