

GLOBAL NAVIGATION SATELLITE SYSTEM DATA ANALYZER SOFTWARE

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ABSTRACT: *In current scenario we are very much aware about the device which is used for tracking and navigation purpose and that is the GLOBAL POSITIONING SYSTEM and of whose data can be used for several types applications. This GPS data can be further used for analysis of the trip, elevation profile. Different GPS receivers support different formats for positioning, Marine Electronics (NMEA) as an interpreter for logging GPS data*

Introduction

A satellite route or satnav framework is a framework that utilizes satellites to give geo-spatial situating. It little electronic recipients to decide their area (scope, longitude, and height or rise) to high precession (inside a couple of meters) utilizing time signals transmitted along an observable pathway by radio from satellites. The framework can be utilized for giving position, route or for following the situation of something fitted with a recipient (satellite following). The signs likewise enable the electronic collector to ascertain the present nearby time to high exactness, which permits time synchronization. A satellite route framework with worldwide inclusion might be named as Worldwide Route Satellite Framework (GNSS). As of December 2016, just the US NAVSTAR Worldwide Situating Framework (GPS), the Russian GLONASS and the European Association's Galileo

are worldwide operational GNSSs. However at this point India has just propelled IRNSS with an operational name NAVIC (Route with Indian Group of stars), it additionally right now has satellite based increase framework, GPS Helped GEO Enlarged Navigation (GAGAN). The china has its BeiDou-1 already and BeiDou-2 GNSS by 2020. Global inclusion for every framework is by and large accomplished by a satellite group of stars of 18-30 medium Earth circle (MEO) satellites spread between a few orbital planes. The genuine framework change, yet utilize orbital tendencies of >50 degree and orbital times of approximately twelve hours (at an elevation of around 20,000 kilometers or 12,000 miles).

1. EXISTING SYSTEM

The current framework, is for just deciding client data, for example, position, speed and time without robotization, additionally satellite data, for example, information rate, number of satellites, orbital speed thus on. Here in existing framework the framework isn't mechanized. Thusly the quality isn't improved and it is conflicting. The outcome isn't relevant according to substantial information.

2. PROPOSED SYSTEM

In the proposed framework the standard is created to allow prepared and tasteful information correspondence between electronic marine

instruments, route gear and correspondence hardware when interconnected by means of a fitting interface. This standard is planned to help onr-way sequential information change, for example, position, speed, profundity, recurrence portion, and so forth average messages may run from around 11 to a limit of 79 characters long and for the most part require transmission no more quickly than one message for each second.. The variant NMEA Rendition 4.10 incorporates shipboard, non-shipboard and land base types of gear and systems for sea and other industry use has been extended to incorporate the new Galileo Worldwide Route Satellite Framework oblige Galileo and future GNSS. This adaptation consolidates a few adjustments to Label Square techniques that were recently distributed as NMEA EREATA #0183 0910 01.Each NMEA sentence starts with \$ and can't be longer than 80 characters for each location including line eliminators. In these sentences the information things are isolated by commas. Each sentence contains a checksum additionally which could possibly be checked by the unit that peruses the information. The checksum contains '*' and two hex digits which speaks to a 8bit select OR of all characters between, however excluding '\$' and '*'.

Sentence Arrangement:

"\$" - Beginning of the sentence

"aacc" - Address Field.

"," - Field delimiter.

"c- - c" - Information Sentence square. Information field might be of variable length

"*" - Checksum delimiter.

"hh" - Checksum Field. The absolute value calculated by exclusive-ORing.

"<CR><LF>" - Carriage Return.

3.1 NMEA Formats:

GGA- Global Positioning System Fixed Data.

GSA- GNSS DOP and Active satellites

GSV- GNSS Satellites in view

RMC- Recommended Minimum Specific GNSS Data

VTG- Course Over Ground and Ground speed

ZDA- Time and Date.

3. IMPLEMENTATION

The execution is the place the definite structure is really changed into the working code of the venture. Point of the stage is to make an interpretation of the structure into a most ideal arrangement in an appropriate programming language.

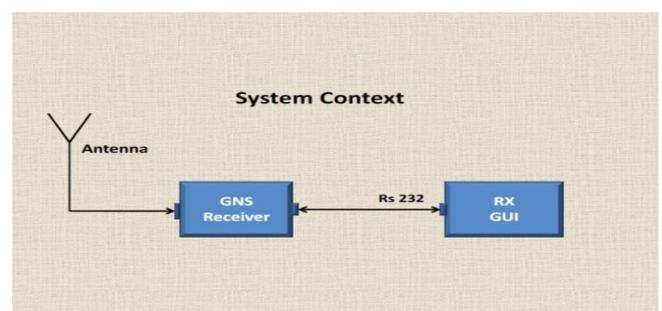


Figure 1:-System Design

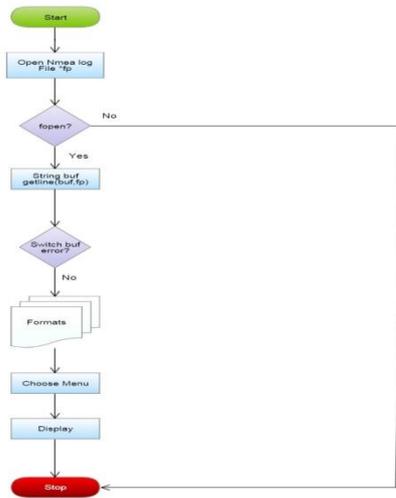


Figure 2:- Flow Chart

The execution stage requires the accompanying errands:- Cautious arranging. Examination of framework and constraints.Design of strategies to accomplish the changeover .Assessment of the changeover method.Correct choices with respect to determination of platformAppropriate choice of language for application..

4.1 METHODS:

Crude information – It shows the information present in the log record.

Satellite Data – The data, for example, satellite id, azimuth, rise, transporter to commotion thickness and star grouping to which it belongs to.Plots

Sky plot, Elevation plot, Speed plot, DOP plot, Heavenly body plot, Position plot are every one of these plots utilized.

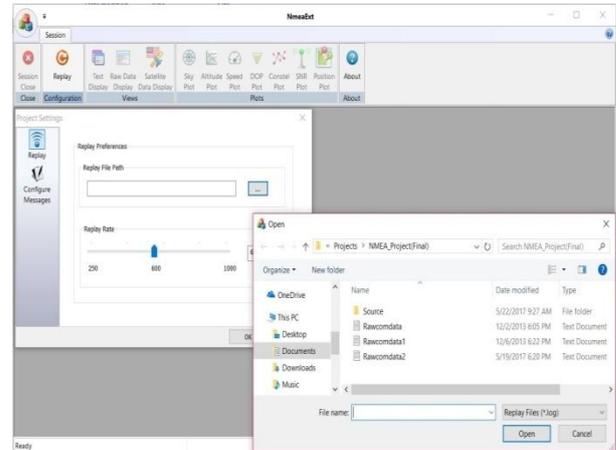


Figure 3:- Accessing the file

The above figure demonstrates perusing for the log document from which the information must be separated. The information is extricated from the collector end where it is arranged in the GPS area preparing framework.



Figure 4:- Satellite Data.

The above figure demonstrates the satellite data. The data incorporates satellite ID, Azimuth, Height, Transporter to clamor and constel to which it belongsThe GPS SV ID above is the empower/cripple record used to empower or incapacitate a determination of 32 GPS satellites once empower, the wellbeing state of the satellites

are disregarded and the GPS flag transmissions from satellites are viewed as when registering position arrangements. Azimuth degrees is one of the satellite in the GPS satellites which portrayal ranges from 000 to 359 and, Height degree satellite extends greatest to 90 and the Constels N and Y implies, the satellites communicates two flags each time thus L1 is named N and L2 as Y.

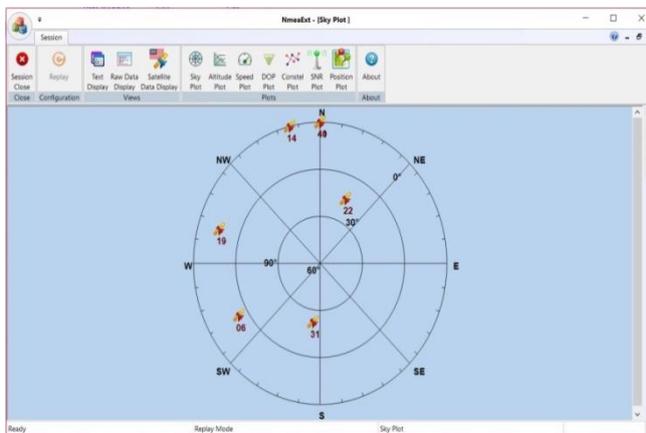


Figure 5:- Sky Plot.

The above figure demonstrates the satellites which are engaged with following the position. The skyplot is utilized to contemplate the satellite AZIMUTH and ELEVATION.angles or degrees This sky plot utilizes GPGSV NMEA order to extricate azimuth and rise for each satellite that is in view. Each satellite is recognized by Pseudo Arbitrary Number(PRN) with letters 'An' and 'E' meaning its situation as far as azimuth and height points individually. The red images shows the dynamic satellites in their separate points and degrees to North,South,East,West. The red numbers shows how and at what degree the satellite is utilized in the position arrangement and the numbers in dark demonstrates that the satellite

isn't put tgo use in arrangement.



Figure 6:- SNR Plot.

The above figure demonstrates the flag quality gotten by the gadget from a satellite. The SNR plot is Motion to-Commotion Proportion plotting that shows the quality of the signs. The C/N0 (Y-axis)is Carreir-to-Commotion Thickness proportion and Saterllie ID (X-hub) is azimuth and height degrees.

4. APPLICATION

This venture is effectively actualized and created for constant GPS information logging. As consequence of this is ongoing GPS information with logging interim 1 second can store in content document which is additionally utilized for investigation. By this information time and speed diagram, height profile can be created. By time and speed diagram the traffic clog and areas where vehicle ceased can be broke down.

5. CONCLUSION AND FUTURE ENHANCEMENT

We have built up an extraction apparatus that investigations information from log documents produced by GPS recipient and gives client and satellite data to the client. A graphical showcase is constantly wonderful to take a gander at contrasted with anumerical show. The changing probably won't bode well to acommon man, yet just to an individual with a thought of topography. Subsequently this item can be additionally improved in order to show the client positions on a LCD graphical screen, which is topographical guide of the neighborhood. The level of the zone could be just a bit of the town, a full city, or the entire state. The position datum gotten by the gatherer can be given to a screen controller-a floating point controller controls the introduction of a spot on a LCD screen subject to the given wellsprings of data..

6.1 Future Enhancement:

The application can be extended to various working frameworks other than windows. This undertaking can be executed as an online application. The task can be made increasingly intelligent by tolerating at least one log documents and determining the most brief way between them.

6. REFERENCES

- [1] Mohad Shob, Kamal Jain and M Anullhaq-Devolpment and Implementation of NMEA Interpreter for Real Time GPS Data Logging, 3rd IEEE International Advance Computing Conference (IACC), 2013
- [2] Afshan Mulla, Jaypal Baviskar and Aniket Bhovad-GPS Assisted Standard Positioning Service for Navigation and Tracking: Review and Implementation International Conference on Pervasive Computing (ICPC), 2015
- [3] M. Grondin, M. Belasic, L. Ries, J. L. Issler, P. Bataille, L. Jobey, and G. Richard, "another operational minimal effort GNSS programming beneficiary for microsattelites",. In NAVITEC 2010, Noordwijk. The Netherlands, December 8-10-2010.
- [4] Sonal N. Parmar, Sumita Nation, Kanchan bakade, Dolly Sen-An Efficient Mobile GPS Navigator, Tracker And Altimeter System For LocationBasedServer.
- [5] LOG-Distance Path Loss Model-Based Relative Distance Estimation Method September-2016, Journal Of Computational And Theoretical Nanoscience.- Sang-Geol Lee. Yunsick Sung.
- [6] W. Roberts, M. Bavaro, S. Vaccaro, E. D. Tijero, A. Sage, F. Legrand, and C. Hill, "PRECISIO-plan contemplations for a multiconstellation, multifrequency programming get
- [7] A Fridman and Semenov, "Framework On-Chip FPGA-based GNSS r", in NAVITEC 2010, Noordwijk, the Netherlands-2010.
- [8] S. Fantinato, L. Foglia, P. Iacone, D. Rovelli, C. Facchinetti, and A. Tuozi "PEGASUS GNSS collector stage for security of life client portion", in NAVITEC 2012, Noordwijk, The Netherlands. beneficiary" in IEEE East-West Design and Test Symposium, September 2013.
- [9] B. Huang, Z. Yao, F. Guo, S. Deng, X. Cui, and M. Lu, "STARx-a GPU based multi-framework full-band continuous GNSS programming receiver", in ION GNSS 2013, Nashville, TN, Sept. 2013, pp.

[10] R.Garello,L.Lo Presti,G.E.Corazza, and J.Samson, "distributed agreeable situating. Part 1:GNSS helped obtaining", Inside GNSS, walk 2012

[11] P.Henkel, "Firmly coupled exact point situating and frame of mind assurance", IEEE Transactions on Aerospace and Electronic Systems,- october-2015.

[12] P.Henkel,A.Sperl, "exact RTK situating with GPS/INS Tight coupling and Multipath Estimation",Proc. Of the 2016 Intern. Techn, Meeting of the Institute of Navigation(ION),pp-2016.

[13] P.Henkel,M.Iafrancesco,A.Sperl, "Presise point situating with multipath estimation", proc. of Position Location and Navigation Symp(PLANS),pp-2016

[14] Antonio Cavaleri. "Recognition of Spoofed GPS Signal at Code and Carrier Tracking Level", NAVITEC - 2010.

[15] Inone Joo, "GPS L5 Acquisition Schemes for Fast Code Detection and Improved Doppler Accuracy" ETRI Journal,- Feb-2010