KSCST

Karnataka State Council for Science and Technology

Indian Institute of Science Campus, Bengaluru - 560 012

Telephone: 080-23341652, 23348848, 23348849 • Telefax: 080-23348840
Email: office@kscst.iisc.ernet.in, office@kscst.org.in • Website: www.kscst.iisc.ernet.in, www.kscst.org.in

Dr. S. G. Sreekanteswara Swamy
Executive Secretary

Ref: 7.1.01/SPP/08

28th March 2018

The Principal,
Alva's Institute of Engineering and Technology,
Shobavana Campus,
Mijar,
Moodbidri - 574 225.

Dear Sir,

Sub : Sanction of Student Project - 41st Series: Year 2017-2018
Your Project Proposal Reference No. : 41S_BE_0942

Ref : Your Project Proposal entitled " **ESTIMATION AND VISUALIZATION OF 3D ORBITS OF GPS SATELLITE USING GPS NAVIGATION DATA FILE FROM MANGALORE GNSS RECIEVER**

I am happy to inform that your project proposal referred above, has been approved by the Secretary, KSCST for 'Student Project Programme - 41st Series' and has been sanctioned with a budgetary break-up as detailed below:

Student / s	Mr. Ashok Singh Raj Purohit and others	**Budget**	**Amount (Rs)**
		Materials/Consumables	2,500.00
Guide/s	Dr. Dattathreya S Gujjar	Labor	-
		Travel	500.00
Department	Electronics And Communication Engineering	Miscellaneous	500.00
		Report	500.00
		TOTAL	4,000.00
	RUPEES FOUR THOUSAND		

The following are the guidelines to carryout the project work :

The project should be performed based on the objectives of the proposal sent by you.

The project should be completed in all respects and one copy of the hardbound report along with softcopy of the full report in a CD (.pdf format) should be submitted to KSCST.

Any change in the project title and objectives, etc., or students is liable to rejection of the project and the amount sanctioned needs to be returned to KSCST.

Please quote your **project sanction reference number printed above** in all your future correspondences.

Important: After completing the project, 2 to 3 page write-up (synopsis) needs to be sent by e-mail [spp@kscst.iisc.ernet.in] and should include following :

1) Title of the project
2) Name of the College & Department
3) Name of the students & Guide(s)
4) Keywords

6) Introduction / background 41S_BE_0942

(with specific reference to the project, work done earlier, etc) - about 20 lines

6) Objectives (about 10 lines)

7) Methodology (about 20 lines)

(materials, methods, details of work carried out, including drawings, diagrams etc)

8) Results and Conclusions

(about 20 lines with specific reference to work carried out)

9) Scope for future work (about 20 lines).

(Note: The write-up (Synopsis) should be sent with the approval of project guide. The softcopy of the write-up, in MS Word format, should be sent by e-mail (spp@kscst.iisc.ernet.in). In your e-mail, please also include project proposal reference number and title of the project.)

e) Projects selected for Seminar / Exhibition will be awarded.

The sanctioned amount will be sent separately by our Accounts Department.

The sponsored projects evaluation will be held in the Nodal Centre and the details of the nodal centre will be intimated shortly by e-mail / Website announcement.

Please visit our website for further announcements / information and for any clarifications please email to spp@kscst.iisc.ernet.in

Thanking you and with best regards,

Yours sincerely,

S.G.S. Swamy)

Copy to:

) The Head of the Department of
Electronics And Communication Engineering
Alva'S Institute Of Engineering And Technology,
Shobavana Campus,
Mijar,
Moodbidri - 574 225.

) Dr. Dattathreya S Gujjar
Department of Electronics And Communication Engineering
Alva'S Institute Of Engineering And Technology,
Shobavana Campus,
Mijar,
Moodbidri - 574 225.

) The Finance Officer, KSCST, Bangalore

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"Jnana Sangama" Belagavi – 590 010

PROJECT REPORT ON

"ESTIMATION AND VISUALIZATION OF 3D ORBITS OF GPS SATELLITES USING GPS NAVIGATION DATA FILE FROM MANGALORE GNSS RECIVER"

Submitted in partial fulfillment of the requirements for the award of degree

BACHELOR OF ENGINEERING
IN
ELECTRONICS & COMMUNICATION ENGINEERING

Submitted By

Name	USN
Anushree Shettigar	4AL14EC008
Apoorva D	4AL14EC010
Ashok Singh Raj Purohit	4AL14EC014
Harshith Somanna PB	4AL14EC038

Under the Guidance of

Dr. Dattathreya
Dean (Planning) and Sr. Professor
Department of E&C Engineering

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY
MOODBIDRI – 574 225.

2017-2018

ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY

MOODBIDRI – 574 225

(Affiliated to VTU, BELAGAVI)

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

CERTIFICATE

Certified that the project work entitled "**ESTIMATION AND VISUALIZATION OF 3D ORBITS OF GPS SATELLITES USING GPS NAVIGATION DATA FILE FROM MANGALORE GNSS RECIVER**" is a bonafide work carried out by

Anushree Shettigar	**4AL14EC008**
Apoorva D	**4AL14EC010**
Ashok Singh Raj Purohit	**4AL14EC014**
Harshith Somanna PB	**4AL14EC038**

in partial fulfillment for the award of BACHELOR of ENGINEERING in **ELECTRONICS & COMMUNICATION ENGINEERING** of the **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI** during the year 2017–2018. It is certified that all corrections/suggestions indicated for internal assessment have been incorporated in the report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of project work prescribed for the Bachelor of Engineering degree.

24/5/18 D.V. 24/05/18

Signature of the Guide	Signature of the H.O.D	Signature of the Principal
Dr. Dattathreya	Dr. D V Manjunatha	Dr. Peter Fernandes

H.O.D
Dept. Of Electronics & Communication
Alva's Institute of Engg. & Technology
Mijar, MOODBIDRI - 574 225

PRINCIPAL
Alva's Institute of Engg. & Technology,
Mijar, MOODBIDRI - 574 225, D.K.

EXTERNAL VIVA

Name of the Examiners	Signature with date
1. Sudhakara. H.a	11/6/2018
2. Raj Kiran Shetty 11/6/2018	11/6/2018

ABSTRACT

The main aim of the project is to estimate and visualise the 3D orbit of GPS satellite by extracting data from GPS navigation data file which is obtained from Mangalore GNSS receiver. The data extracted are compared with RINEX file and implemented in the formulas to obtain XYZ coordinates of GPS satellite and plotted in 3 Dimension by using MATLAB tool. The GPS navigation data file is extracted from GNSS receiver which contains the data of GPS satellite. These data are segregated by comparing with RINEX file and are substituted in the formulas by using MATLAB. We get XYZ coordinates of GPS satellite from formulas and a 2D plot is obtained. Then the 2D plot is interpolated by increasing the number of samples. Another 2D plot is obtained by extracting data from SP3 file which is an error free GPS data file. Both the 2D plots are compared and the variance is found which indicates the amount of error present in data of GPS navigation data file. The 2D plot which is interpolated is then converted in 3D plot with ECEF coordinates.

The path of GPS satellite in space, orbiting around the earth is estimated with earth as centre. The plot is obtained with respect to poles as well as equator. In future this work can be extended by converting 3D plot from earth centred and earth fixed coordinates to receiver centred coordinates. The GPS navigational data file is received from the GNSS receiver. The data is extracted and segregated from the navigational data file by comparing it with RINEX file. The extracted data is substituted in the formulas using the MATLAB code to obtain the XYZ coordinates. These XYZ coordinates are plotted in 2D and interpolated. The GPS data file extracted from SP3 file are also plotted in 2D and interpolated. These two interpolated signals are compared, and variance is found which indicates error present in satellite path. The interpolated signal obtained from SP3 data file is converted into 3D plot with Earth Centered Earth Fixed coordinates.