





## *Message*

I have great pleasure in presenting the book of research papers presented at the two day **National Seminar on Geo-informatics** held under the auspices of VPM's Polytechnic during Friday, 08 December and Saturday, 09 December 2006 at Thane College Campus.

We have been conducting seminars on different subjects since 2004.

Frontiers of knowledge are advancing so rapidly that it is very difficult to keep pace with the speed. Information technology has revolutionized all branches of knowledge. Traditional Geographical surveying had its own limitations and applications were limited to Military and Governmental departments. European countries could establish their hegemony over other continents when they started mapping the earth with more accuracy. Trigonometrical Survey of India started by British Colonial Government in the early nineteenth century is the best example of what power of cartographic information can do to a Nation. There is a lesson to be learnt from this history of geography.

The application of modern science to this branch of knowledge has revolutionized the way we can use this information in our day to day life. It can not only help but also enhance human ability to function with accuracy. It has given birth to new industries giving more employment opportunities. India is carving her position in the leading economies of the World. Educated human resource is going to be the key to this opportunity. I am sure this seminar will help our students and teachers in shaping their career better.

I wish this seminar a grand success.

**Dr. Vijay V. Bedekar**  
Chairman  
Vidya Prasarak Mandal, Thane



### *From Convener's desk*

**Geo Informatics** is a specialized application area of Information Science to provide real time information of global nature. This subject will assume extensive importance in the near future and will be a wonderful career option for technology professionals. The advanced countries in the world are already reaping the benefits of Geo Informatics in the field of e-governance, space information, geographical details, land mapping for better administration, global positioning etc.

The biggest advantage of this stream of information science is the possibility of prediction of geological behaviors well in advance, may it be tsunami, cyclone warnings, earthquake or any other forms of natural calamities, which are the major causes of global causalities and human sufferings. The prediction of such disasters well in advance can reduce the threats and pains to the lives.

Civilized industrial world richly deserves all the modern technological benefits. The increasing global population, safety and health issues will demand geo informatics systems in place. It would be a true gift from the developed countries to developing countries, if technology transfer takes place for uplifting the standard of living.

Polytechnic is making good efforts in catching up with the global trends and technologies. It is worthwhile to mention that the students here would be a privileged lot to have value addition to their academic education. With the demand rising for skilled technical manpower worldwide, these efforts will prove beneficial in updating the knowledge base.

The hard work put in by the team of teachers of the Polytechnic, initially in understanding the subject and to connect with the right resource people is worth appreciation. The consent received even from foreign speakers is the indication of the awareness of the subject. Though the theme is quite complex in nature, the purpose of introducing this area to the delegates will serve a long way in achieving our objectives.

The delegates and contributors will deserve credit for showing their interest in the Conference. Participation and knowledge sharing will help in future development of the technology. On behalf of organising team, I convey my sincere appreciation to all the members responsible for the outcome of the Conference.

With gratitude, we do acknowledge the support extended from Department of Information Technology Govt. of India, ISRO, Department of Space Nagpur and Banglore, Maharashtra State Board of Technical Education and Lavasa Corporation Ltd.

The distinguished members of the Advisory Panel have extended their whole hearted support to have best contribution from the authors.

Every year we organise national conferences on the subjects which help in upgrading the technical know how among the faculty members and students. Last year's seminar on **Alternative Energy**

**Sources** has boosted our morale boost for continuing innovative developments. The studies done by faculty has already made impromptu effect on the areas of energy conservation, audit and renewable energy applications. I am also glad to mention the support of Ministry of Non Conventional Energy Sources, New Delhi for the seminar and the Energy Park Project. This will enrich our infrastructure for the conduct of programmes and activities.

We are thankful to the India Meteorological Department for choosing our campus for installation of '**Automatic Weather Station**' a state of the art Geo Informatics application. We shall have many more applications in the near future.

I am sure it is a matter of great delight to Vidya Prasarak Mandal that the Polytechnic organises such events, which are supplementing its reputation.

The Geo Information Science will go a long way in helping the globalized world to have better industrial productivity and assure a better quality of life to the mankind.

**Prof. D. K. Nayak**  
Principal



### *Message from the Advisory Committee*

Geo-informatics, the art and science of collecting, storing, presenting and analyzing spatial information related to the Earth and its environment, has contributed significantly to the progress of human civilization through the centuries. The Geographical Information System (GIS), and the Global Positioning System (GPS): the two aspects of Geo-informatics, have evolved over the last two decades, to become the most important developmental and planning tools of modern times. Today, there is no field of human development, natural resource management, science, engineering, and technology, where these revolutionary systems do not play a significant role.

GIS, an advanced technique for digital handling of map-data, provides the most effective, economic and efficient tool for storing, manipulating, and presenting spatial and non-spatial information in an integrated manner. GPS, a satellite-based navigation and surveying system for determination of precise position, velocity and time, is being used all over the world for numerous navigational and positioning applications, including navigation on land, in air and on sea, determining the precise coordinates of important geographical features as an essential input to mapping and GIS, precise cadastral surveys, vehicle guidance, earthquake and landslide monitoring, etc. In India also, GIS and GPS are being used widely for numerous applications in diverse fields by various Governmental and non-governmental organizations, and the field of their applications is ever-widening. Manpower development is the key issue in adopting this new technology.

In this context, the National Seminar on Geo-informatics, being organized by VPM Polytechnic, is an important step towards evoking the interest of the engineering students and faculty, and introducing them to the numerous applications, for the benefit of the common man. On behalf of the Advisory Committee, I wish the Seminar all success.

**Dr. Madhav N. Kulkarni, Lt. Col. (R),**  
Professor of Geodesy & Remote Sensing,  
Indian Institute of Technology, Bombay



## *Message*

Two days National Conference on the theme Geo-informatics is a wonderful effort in acquiring technology know-how of the present decade.

The Information Science boundaries are extended to such an extent that it can assist the Engineers and Scientists in utilizing the expertise in geo computation and geographic information system.

The emerging branch of Information Technology will help Geologists, Meteorologists, Navigation experts and all those concerned with global communication systems. The prediction of accurate weather forecasting, Earthquake warnings, natural calamities, etc. can help in providing additional safety to the world population.

While Industry and Institutes are in the threshold of attaining excellent rapport, such Conferences can prove to be extremely beneficial. Today's Engineering manpower is highly talented and training them in the latest technology will be the need of the hour.

Maharashtra State Board of Technical Education believes in very strong academic – industry bond. Teachers are regularly deputed to industries for undergoing training in the current technologies and their futuristic trends. Importance and impact of Content Updating Trainings, life skills trainings needs to be realised more seriously.

The distinguished panel of speakers will share their views on the subject and the exhibition of products will help in fulfilling the objectives. The future Engineers and professionals, for sure will get the fair idea of this field.

I congratulate the Organizing Committee for their initiative demonstrated in organizing this activity and wish the conference a grand success.

**Prof. B.P.Tale**  
Director,  
Maharashtra State Board of  
Technical Education, Mumbai (M.S)

## *Message from Lavasa Corporation Limited*

Lavasa Corporation Limited is proud to be associated with the Third Annual Conference on Geo-Informatics being conducted by VPM's Polytechnic. Such events go a long way in disseminating the value of GIS and in propagating its usage. Lavasa Corporation Limited also has a policy of industry-academy interaction which we believe fosters the true spirit of exchanging knowledge on GIS.

Lavasa Corporation Limited wishes the conference the very best of luck. May the event be a resounding success.

**Dr. G. S. Rao**  
Head, GIS  
Lavasa Corporation Limited



## *Trekking the Technology*

My appointment as the organizing secretary of the 3<sup>rd</sup> Annual National Conference on Geo-Informatics in August 2005, literally had begun my journey in the field of Geo-Informatics with a background of Electronics and Information Technology. Obviously the trust instilled by our patron Dr. V.V. Bedekar and the convener, Principal D.K. Nayak to organize this, was the key motivation!

Our Polytechnic thrives on its approach to update the existing knowledge continuously by abiding to the requirements of industries. The feedback is relegated to start a 'Chain Reaction' in the form of industry-institute interaction. Hence it was indeed a bold initiative to take such a giant leap to conduct a National Conference on a theme like Geo-Informatics.

I am really overwhelmed at the approach of our supporters namely the Department of Information Technology (Ministry of Communications & Information Technology) Govt. of India, Indian Space Research (ISRO), Maharashtra State Board of Technical Education, Mumbai (MSBTE), Lavasa Corporation Limited(Mumbai). These institutions and organizations have extended their help for the smooth conduct of this conference.

Dr. Krishna Murthy, Scientist-SG & Head of Regional Remote Sensing Service Centre, ISRO, Dept. of Space, Govt. of India, Nagpur appreciated our genuine interest of taking the technology to the common man & create awareness. I am highly indebted to all the assistance being provided by him. Our team got a necessary direction to augment our efforts.

It is my privilege to acknowledge the efforts taken by Mr.R. Soreng , Dy Director, D.I.T for providing guidance towards achieving support from D.I.T as a major sponsor.

The efforts put into by each and every member of Advisory Committee is worth appreciating as they had utilized their personal contacts to chalk out the programme of the conference.

Every hierarchy in the society attributes for its development. The department of Forestry, Police of Maharashtra state, Brihan Mumbai Corporation, Bhabha Atomic Research Centre and Social Frestry division,Thane gave their vital inputs.

The Indian Institute of Technology, I.I.T. Powai, managed a priviledged slot for few of our students to undergo training in the field of GIS operating software. This would not have been possible without the wholehearted support of Dr. Madhav Kulkarni Professor, I .I. T. Powai & honourable-member of advisory committee of this National Conference.

The outcome of this conference is the installation of Automatic Weather Station at our campus. Dr. R.D Vashishtha played a key role in accepting our proposal for this installation, which is the first one of its kind in the city.

I am sure that this Conference will set up a forum to allow a thorough interaction between the researches, institutions and the industry to make this technology more viable.



It's a journey.... Acknowledging a number of milestones; each step unfolding a lot of learning, developing contacts and long lasting associations! The journey would still continue by exploring more and more dimensions giving us every chance to unleash our potential. It was an experience to be cherished as every experience helps us to metamorphosis into a new graduate.

I thank all for the support extended for this journey, which embarked from visualization to materialization!

**Mrs. Kirti S. Agashe,**  
Organizing Secretary.

# Acknowledgements

to

*Project Exhibitors*

No.	Project Name	Project guide	Team members
1	I.I.T. Demonstration of GIS software (TGO & path finder)	Dr. Madhav Kulkarni	Students of I.I.T. and VPM's Polytechnic, Thane
2	I.I.T. Demonstration of GIS software (TGO & path finder)	Dr. Madhav Kulkarni	I.I.T. Students and VPM's Polytechnic, Thane
3	Forestry (Samajik Vanikaran Vibhag Management) (Application of Geo-informatics in water shade management)	—	Samajik Vanikaran Vibhag Management, Thane
4	Rolta GIS, GPS equipment	—	—
5	Anil corporation	—	—
6	Ashida Electronics, Thane	GPS receivers	Praveen Pillai & Team
7	Lawrence & Mayo	—	Mr. D'souza & Team
8	SMS Based device controlling and	Mrs. Nisha Kothavade	Ramkrishna P. Bhandare
9	Location positioning system (T.Y.I.F.)	Mrs. Usha Raghavan	Suraj V. Joshi Ajit A. Kulkarni
10	Satellite communication (S.Y.C.O)	Mrs. S. K. Shukla	Mr. Vipul Shenvi Mr. Prabhakar Kadam Mr. Nitish Shah Mr. Pranay Hegde
11	Laxmi book Depot	Book stall	Mr. Vijay Shinde & Team

## **Acknowledgements**

**V.P.M's Polytechnic sincerely acknowledges the support of following organizations**

- Dept. of Information Technology – Govt. of India, Ministry of Communications and Information Technology.
- India Satellite Research Organization (ISRO) Nagpur / Bangalore.
- Maharashtra State Board of Technical Education, Mumbai.
- Lavasa Corporation Ltd., Mumbai.
- India Meteorological Dept., Pune.
- Dept. of Civil Engg. IIT, Mumbai.
- Additional Ambernath Manufacturer's Association.
- Mumbai Police (Administration).
- Bruhanmumbai Municipal Corporation, Disaster Management Dept.
- Social Forestry Division, Thane.

3<sup>rd</sup> Annual National Conference

# Geo-Informatics

8<sup>th</sup> & 9<sup>th</sup> December 2006

## PROGRAMME

Program Schedule

DAY-I

Friday 08<sup>th</sup> Dec. 2006

Session	Name of Person	Paper Details	Time
Inaugural session	Inaugural Function		09.00 - 10.00a.m.
	<b>Dr. V. K.Dadhwal</b> The Dean, Indian Institute of Remote Sensing & Director incharge for CSSTEAP, Dehradun	Keynote address	10.00- 10.30 a.m.
<b>Tea Break</b>			<b>10.30- 10.45 a.m.</b>
<b>Session I - G/S Surveying &amp; Mapping</b>			
<b>Chair Person- Dr. G.S. Rao</b>			
	<b>Dr. A.K.Joshi</b> Scientist –SF RRSSC, Department of Space, Govt. of India,Nagpur.	Application of Regional GIS data bases in effective planning & implementation in developmental activities	10.45- 11.15 a.m.
	<b>Dr. G.S. Rao</b> Head - GIS Lavasa Corporation Limited, Mumbai	Use of GIS in Improving Rural Health Services	11.15- 11.35 a.m.
	<b>*Mr.Ashish Shah</b> Asset Engineer Citiworks,Townsville City Council Australia <b>Ms. Kanan Saraiya</b> Infrastructure Planning Officer Planning & Development Townsville City Council Australia	Innovative Infrastructure Management through GIS: Australian Prospective.	11.40.12.00 p.m.

<b>Session I Continued</b>			
	<b>Mr. Sumit Sen</b> University of Münster, Robert Koch str 26, 48149 Münster, Germany	Sematic Interoperability based on Geospatial antologies	12.00- 12.15 p.m.
	<b>*Ms.Parul R. Patel</b> <b>Dr. Madhav N. Kulkarni,</b> <b>Mr.Anand D. Hiroji.</b> Department of Civil Engineering, Indian Institute of Technology Bombay,	Land subsidence monitoring using global positioning system	12.20-12.35p.m
	<b>*Mr. Bhavesh Patel</b> HOD Computer Department Shah & Anchor Kutchhi Polytechnic, Chembur <b>Mr.B. B. Meshram</b> Asth. Prof., Dept. of Computer Tech. Veer mata Jijabai Technological Institute Matunga, Mumbai	Mining and Clustering Images to Improve Image Search Engines for Geo-Informatics Database	12.35-12.50 p.m.
<b>PRODUCT DISPLAY SESSION</b>			<b>12.50-1.00 p.m</b>
<b>LUNCH BREAK</b>			<b>01.00- 01.45 p.m</b>
<b>Session II - Remote Sensing</b>			
<b>Chair Person- Dr. A.K.Joshi</b>			
Co-Chair Person	<b>*Dr. Dhananjay Pandit</b> Scientist/Engineer-SE RRSSC/ISRO, Nagpur <b>Dr.Y.V.N. Krishna Murthy</b> Scientist-SG & Head of RRSSC, ISRO, Dept. of Space, Govt. of India, Nagpur.	Application of Remote Sensing & G/S in water Resources Management	01.45-02.15 p.m
	<b>*Mr. Rakesh Bajpai</b> <b>Mr. P.K.Narayan</b> Back End Technology Development Division Nuclear Recycle Group Bhabha Atomic Research Center Department of Atomic Energy, Mumbai.	Role of Geo-informatics in Site Selection and Characterization of Radioactive Waste Disposal Facilities	02.15-02.35p.m
	<b>Mr. Mangesh Waghmare</b> Project engg.,Enviro vigil, Thane	Water Quality Analysis of Water Bodies in Mumbai and Thane District using Remote Sensing and GIS	02.35-02.55p..m.
	<b>Ms.Michelle Vishwanathan</b> Student St.Xavier's College, Mumbai (1 <sup>st</sup> Prize Winner of Paper presentation competition on 'Geo- Informatics & Remote sensing')	Remote Sensing	02.55-03.05p.m
<b>TEA BREAK</b>			<b>03.05-03.20p.m</b>

<b>Session III-GPS Fundamentals and Applications</b>			
<b>Chair Person- Mr. Rahul Kulkarni</b>			
	<p><b>*Mr. Rahul Kulkarni</b> (Sr. Manager Marketing, Communication Division, NG Siemens Ltd, Mumbai)</p> <p><b>Mrs. Kirti S. Agashe</b> I/C Head of Dept. Industrial Electronics V.P.M's Polytechnic, Thane</p>	Global Positioning System	03.20-3.40p.m
	<p><b>Mr. N.G.Akolkar</b> (College of Fisheries, JAU, Veraval)</p>	Application of GPS in enhancing fish production	03.40-04.00 p.m.
	<p><b>*Mr. Mahendra Kamath</b> <b>Dr. Madhav N. Kulkarni,</b> Department of Civil Engineering, Indian Institute of Technology Bombay.</p>	GPS-INS Pseudolite integration for Navigation.	04.00- 04.20 p.m.
	<p><b>Ms. Anushree Shenoy</b> Student V.P.M's Polytechnic, Thane (2<sup>nd</sup> Prize Winner of Paper presentation competition on 'Geo- Informatics &amp; Remote sensing')</p>	GPRS Technology Overview	04.20- 04.30 p.m.

**Program Schedule**

**DAY-II**

**Saturday 09<sup>th</sup> Dec. 2006**

<b>Session</b>	<b>Name of person</b>	<b>Paper Details</b>	<b>Time</b>
<b>Session IV- Geo- Informatics &amp; Application</b>			
<b>Chair person- Mr. K.G. Matapurkar</b>			
	<p><b>Mr. K.G Matapurkar</b> Ex-Deputy Director, Telecommunication Engineering Centre Department of Telecommunications</p>	Location Based Services	09.30-10.00 a.m.
	<p><b>Brig. Tayal</b> Survey of India Pune</p>	Resources management and geo-informatics	10.00- 10.30 a.m.
	<p><b>Dr. Rajan Welukar</b> Vice Chancellor, Yashwantrao Chavan Maharashtra Open University (YCMOU) Nashik, Maharashtra</p>	Geo-Informatics in Education	10.30-11.00a.m.
<b>TEA BREAK</b>			<b>11.00-11.30a.m</b>

<b>Session V-Meteorology Surface instrument</b>			
<b>Chair person- Dr. R.D Vashishtha</b>			
	<b>Dr. R.D Vashishtha</b> (M.Sc., PhD. Physics) Dy. Director general of Meteorology, India Meteorological Dept. Pune	Role Of GPS in Meteorology in Respect of Surface Meteorological	11.15- 11.45a.m.
	<b>Mr. Y.L.P.Rao</b> Joint Director, Directorate of Social Forestry Maharashtra State, Pune.	Geoinformatics in Forestry Application of Geoinformatics for Working Plan Preparation	11.45-12.10 p.m
	<b>Mrs. G.S. Ingawale</b> Senior Lecturer, V.P.M's Polytechnic, Thane	Remote Sensing and Geo- informatics Wild life ecology application	12.10-12.30 p.m
	<b>*Mr. Saradkumar Shah</b> Professor & Head, H. & A.S Dept., Parshvanath College Engineering, Thane <b>Mr.M.P.Chavan</b> Principal, M.M.J.S. Polytechnic	Indian Agricultural Scenario and Precision Farming	12.30- 12.45 p.m.
	<b>Miss Neha Rastogi</b> Student Muchhala Polytechnic, Thane (3 <sup>rd</sup> Prize Winner of Paper presentation competition on 'Geo- Informatics & Remote sensing')	GPS Scenario in Indian Condition Tanker Truck Monitoring System	12.45- 01.00 p.m.
<b>LUNCH BREAK</b>			<b>01.00- 01.45 p.m.</b>
<b>PRODUCT DISPLAY SESSION</b>			<b>01.45-02.00 p.m.</b>
<b>Session VI- Disaster Management</b>			
<b>Chair person- Dr. Madhav Kulkarni</b>			
	<b>Dr. Madhav Kulkarni</b> Professor, Remote sensing department, I.I.T. Mumbai	GPS Studies for Dam & Crustal Deformations-	02.00- 02.30 p.m.
	<b>Mr. Shrikant D. Joshi</b> DCP (Wireless), Bruhan Mumbai Police.	Mumbai Police Now a part of GIS Community	02.30- 03.00 p.m.
	<b>Mr. V.V. Vaidya</b> Chief Officer Disaster Management CCRS, Mumbai	Disaster Management Plan for Mumbai	03.00- 03.30 p.m.
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