Padma Vibhushan for Chairman ISRO

Dr. G.Madhavan Nair, Chairman ISRO has been conferred with Padma Vibhushan, India's second highest civilian honour, on January 26, 2009. This comes after a string of recent awards viz.

- "Public Service Excellence Award" from All India Management Association at the All India Management Association Foundation Day at Delhi (2009).

- NASSCOM's Global Leadership "Award for Vision" for 2008-09 from NASSCOM at Mumbai (2009).

- "Newsmaker 2008" - Manorama News Award (2009).

- "Bharat Asmita Shreshtatva Award-2009" from MIT School of Government, Pune, at New Delhi (2009).

- "CNN-IBN Indian of the Year 2008" in Public Service Category (2009).

- "AK Nair Memorial Award" from The North Malabar Chamber of Commerce by AK Nair Endowment Committee at Kannur (2009).

- "NDTV Indian of The Year" Award at New Delhi (2009)

IIRS family takes pride in congratulating Dr. G. Madhavan Nair Chairman ISRO.
(Source: www.isro.org)

Inside this issue

Editorial Committee

Special Training Programme on "Applications of Remote Sensing and GIS in Ground Water Studies"

A special two-weeks training programme on "Applications of Remote Sensing and GIS in Ground Water Studies" was organized for Central Ground Water Board (CGWB), Ministry of Water Resources, Govt. of India, during January 19–30, 2009 at Indian Institute of Remote Sensing (IIRS), Dehra Dun. A total of 18 officers participated in this course, of which 9 officers were from different Regional Offices of CGWB and the remaining officers were from State Depts. of Haryana, M.P., Orissa, Tamilnadu and Uttarakhand.

The course aimed at providing an understanding of the fundamentals of remote sensing and GIS techniques, and their applications in the field of hydrogeology, with specific reference to ground water targeting and management. The participants had the exposure on different image processing and GIS softwares, such as GEOMATICA, ArcView and ILWIS, and also on GPS and mobile–GIS. Field excursion was conducted on one of the days to Mussoorie–Sahastradhara area for local geological/ hydrogeological understanding with the help of satellite imagery. An excellent reference material was brought out through the sincere efforts of the faculty, which was provided to the participants in hard- and soft-forms.

The valedictory function was attended by Dr. (Mrs.) Anita Gupta, Regional Director and Dr. R.P. Singh, Senior Scientist of CGWB–Uttarakhand Region. It is hoped that the course will throw up newer ideas, in terms of techniques and applications, into the minds of the practicing hydrogeologists and engineers.

S.K. Srivastav

Special Training Programme for Tamilnadu Irrigation Engineers

IIRS organises a number of courses based on the requirements of the user departments. In this series IIRS conducted a special course for the duration of 2 weeks from 16th to 27th February, 2009 for Irrigation Engineers of Tamilnadu sponsored by IMTI, Tiruchi. Total 19 participants (3 from IMTI, 3 from Agricultural Engg. Dept. and 13 from PWD/WRD Tamilnadu) joined the course .

In this training programme lectures were delivered on the topics of GIS Data Formats, Coordinate System and Projections, Analysis of Spatial Data,Network Analysis, Digital Elevation Model and Application of Digital Elevation Model in Water Resources Management and Application of Arc GIS Model builder, Fundamentals of Remote Sensing, Platform, Orbits and Remote Sensing Data Products, Visual and Digital Image Processing,GIS application in Ground Water studies,Hydrological modeling using Arc GIS and SWAT model, Identification of Irrigation infrastructure using high resolution satellite data, Soil Erosion modeling Using Remote Sensing and GIS , Irrigation command area Mapping and performance Evaluation of Irrigation Command. Special emphasis was given to hands on experiences in RS and GIS software.

A Field work was also conducted to show the course participants a one of the oldest(150 years old) irrigation command in India i.e. Upper Ganges Canal command starting from Bhimgoda Barrage at Haridwar. The knowledge gained in this course will benefit the course participants in data base creation, updation, Irrigation Water Management and decision making in irrigation command.

S.P. Aggarwal

Short Course on Remote Sensing

Indian Technical and Economic Cooperation (ITEC) was launched by a decision of the Indian Cabinet on September 15, 1964 as a bilateral programme of assistance of the Government of India. Under ITEC and SCAAP 156 countries in Asia, Africa, East Europe, Central & Latin America, Pacific and Small Island countries are invited to share in the Indian Development experience acquired over six decades of our existence as a free nation.

IIRS organizes two programs for foreign nationals under "ITEC Program" every year. The courses are sponsored by Indian Technical & Economic Cooperation (ITEC) and Special Common Wealth Africa Assistance Plan (SCAAP) of Ministry of External Affairs, Govt. of India. The two courses are of 8 week duration each and are designed for middle level professionals engaged in remote sensing, GIS, GPS and related technologies, applications and projects in their own area of specialization. This year, IIRS has organised one course namely, "Short Course on Remote Sensing with special emphasis on Digital Image Processing", which started on 5th January 2009 and culminated on 27th February 2009. A total of 17 participants from 12 counties attended the "Short Course on Remote Sensing with special emphasis on Digital Image Processing". The next course, "Short Course in Geoinformatics", will be held from 28September to 20 September, 2009. The course details and application procedure for foreign nationals for applying to the course can be obtained from www.itec.nic.in. The courses have proved a platform for sharing and learning the technology with its diverse requirement in various regions of the world.

Ashutosh Bhardwaj

M.Sc. in Geoinformatics

6th batch of M.Sc. Geoinformatics degree course, which started in July, 2007, was successfully concluded at IIRS. In this batch there were eight students and all were self sponsored. Students had undergone 15 months of rigorous educational programme at IIRS and 3 months at ITC, The Netherlands The course consists of 15 theoretical modules and 6 months of research module (equivalent to eight modules). The course follows European credit system. The project proposal was evaluated and approved by ITC research board. The students pursued their 6 months research thesis at IIRS. Students progress were monitored regularly and mid-term evaluation was done by ITC-IIRS experts. Dr. Nicholas Hamm from ITC visited IIRS for the mid term evaluation during October, 2008.

Student's research thesis was evaluated by IIRS and ITC experts and also the thesis were sent for evaluation to Indian experts from various institutions like Prof. P.K. Garg from IIT-Roorkee, Prof. Shakil Ramshoo from Kashmir University, Prof. P.S. Acharya from DST, New Delhi, Dr. V.K. Sehgal from IARI, New Delhi, Dr. P.K. Champati Ray from SDMC, New Delhi, Prof. Anil Rai from IARI, New Delhi and Dr. R.D. Garg from IIT-Roorkee. Finally the students were assessed by Expert Committee through defense presentation on 14th January, 2009. Prof. Alfred Stein of ITC was the Chairman of thesis evaluation board. The ITC experts appreciated the overall quality of the thesis and the programme.

The student research thesis details are:

- Fuzzy c-Means classification of multispectral data incorporating spatial contextual information by using Markov Random Field (Mr. Amitabh Dutta)
- Retrieval of forest parameters from Envisat ASAR data for biomass inventory in Dudhwa National Park, U.P., India (Mr. Shashi Kumar)

- Sampling scheme optimization using uncertainty in fuzzy agriculture parcel classification in the context of urban expansion in urban fringe areas (Mr. Vijay Shanker Pandey)

- A framework for the management of spatial data quality information (Mr. Naveen Kumar Sidda)

- Analyzing the Effect of Different Aggregation Approaches on Remotely Sensed Data (Mr. Rahul Raj)

- Stochastic modelling of land cover (dynamic) elements to assess landslide vulnerability (Mr. Kumar Gaurav)

- Investigating the potentiality of regression kriging in the estimation of soil organic carbon versus the extracted result from the existing soil map (Mr. Navneet Kumar)

- Analyzing tea replantation pattern by wavelet and geospatial technique (Ms. Alka Singh)

"Graduation Ceremony" was organized on 16th January, 2009. Prof. Alfred Stein and Dr. Cees van Westen from ITC participated in the valedictory function. The M.Sc degree certificate was distributed to students by Prof. Alfred Stein along with a customary ITC memento. The efforts put on by IIRS and ITC staff, other guest lecturers and external experts were appreciated and duly acknowledged.

Sameer Saran and P.L.N. Raju

Carbon Flux Measurement and Modeling

Indian Institute of Remote Sensing (IIRS) has undertaken a National Carbon Project (NCP) under Geosphere Biosphere Programme of the Indian Space Research Organization (ISRO) to estimate the carbon pools and fluxes in different terrestrial ecosystems of India. The project envisages temporal inventory of the forest and soil carbon stocks as well as measurement and modeling of carbon exchange along atmosphere-vegetation boundary. The nationwide forest and soil carbon stocks inventory is currently in progress. Six carbon flux measurement towers using eddy covariance techniques are planned in five major forest types of the country at Haldwani (mixed forest plantation), Pauri (oak forest), Barkot (sal forest) in Uttarakhand, Betul (teak forest) in Madhya Pradesh, Dandeli (tea plantation) and Nagarhole (moist deciduous forest) in Karnataka. The first tower at Haldwani has benefit of the cooperation and expertise of the Department of Forest Science and Resources (DISAFRI) of the University of Tuscia, Italy while the tower at Pauri will benefit from the Asiaflux experience of the Department of Meteorological Environment of the Forestry and Forest Products Research Institute, Ibaraki, Japan.

India-Italy Collaborative Project on Measurement of CO2 Flux over Forested Landscape

1. Sonic anemometer
2. Closed path gas analyzer
3. Radiation sensors
4. Automatic weather station
5. Soil sensor (moisture, heat flux & temperature)

(Measurement frequency: 10 MHz)

IRGA & Industrial Computer

Soil Sensor

Flux Tower

The 20m tall Haldwani tower was erected few months ago. All eddy covariance equipments were installed between 14-17 January, 2009. The tower was commissioned and declared operational on 18th January, 2009 by a joint team of scientists from Italy- Dr. Dario Papale, Dr. Paolo Stefani and Mr. Federico Chiani from DISAFRI, University of Tuscia, Viterbo, Italy and India- Dr. S.P.S. Kushwaha, Dr. N.R. Patel, Dr. Yogesh Kant and Dr. Rabindra Nayak from IIRS/ISRO, Dehradun. The tower has 3D Sonic Anemometer, closed path Infrared Gas Analyzer, Automatic Weather Station, PAR Sensor (PAR$\downarrow$ & PAR$\uparrow$), Radiation Sensor (RN$\uparrow$, RN$\downarrow$ & RS$\downarrow$) and Soil Sensor (temperature, moisture and heat flux). The Indian Council of Forestry Research and Education (ICFRE) and Forest departments of the respective states are collaborating in the study. The tower was visited by the Shri R.B.S. Rawat, Principal Chief Conservator of Forests, Government of Uttarakhand on 16th January for first hand information on the scientific objectives of the tower. Both Italians and home team expressed happiness for having installed, calibrated and operationalized the equipment in a record period of time (five days). The first set of data was downloaded in the afternoon on the day of commissioning itself and the data is being analyzed to check the quality and consistency.

S.P.S. Kushwaha

Study of Cellular Automata Techniques for Urban Growth Simulation in GIS Domain

During the last decade, urban population of India increased from 217.6 million to 285 million. This increase in urban population is leading to unregulated growth of urban areas in India. The negative impacts associated with the unregulated growth of urban areas are namely, permanent loss of agricultural land, reduced ground water infiltration, raised greenhouse gas emissions, elevated air and noise pollution levels, damage to various ecological cycles etc. Faced with such severe negative impacts, there is an urgent need for urban planners to manage urban growth more scientifically. In recent years, a number of studies and projects have been undertaken in India to monitor the urban growth using remote sensing and geographic information system (GIS). However, to use these tools effectively, they need to be coupled with urban growth models, for judicious planning and management. This has been the major rationale behind this research work. The main objectives of the research were,

1. To implement Cellular Automata (CA) based models to simulate urban growth in two typical Indian cities i.e., Dehradun and Saharanpur, which have markedly different growth patterns.

2. To evaluate the efficacy of Artificial Neural Networks (ANN) in formation of transition rules for CA based modeling and its comparison with the traditional Multi-Criteria Evaluation (MCE) based CA model.

3. To investigate the effect of different neighbourhood sizes and neighbourhood types in calibration of CA based models.

4. To evaluate the performance of CA based models using Moran Jadex, Percent correct match and Shannon's entropy.

5. To generate ANN based urban growth zonation maps depicting zones of urban growth potential at an ordinal scale.

From the analysis of the results, following general conclusions have been drawn,

1. Dehradun city had a dispersed growth. Therefore, a small neighbourhood produced the highest accuracy in predicting the pattern and location of growth. In Saharanpur city, the urban growth has taken place in a compact and concentric form. Therefore, large neighbourhoods produced the most accurate results.

2. Von Neumann neighbourhood of small size was found appropriate for cities having dispersed growth, whereas for cities having a compact development, both Von Neumann and Moore neighbourhoods were found appropriate.

3. Large number of model iterations failed to increase the accuracy of the models. They resulted in a more compact growth pattern as compared to the actual growth pattern . This may be due to unplanned and stochastic urban growth process in Indian cities, which the CA models are not able to simulate fully.

4. Moran Index and Percent correct match are useful and simple indicators , which can measure how well the simulated growth pattern matches the actual one, in terms of pattern and pixel to pixel match.

5. The accuracy of ANN-CA model was comparable with that of MCE-CA model. Thus, neural networks were able to define the transition rules from the datasets, without any human intervention, in an objective manner, which proves their usefulness.

6. The zonation maps derived from neural network outputs conveyed the actual growth pattern in the respective areas. Thus, preparing such zonation maps may also be valuable input for planning exercises like master and zonal plan preparation.

7. The assessment via Shannon's Entropy shows that the simulated growth is more compact along the roads, whereas with respect to city core, the simulated growth matched with the actual growth.

The research has demonstrated the applicability of Cellular Automata techniques for modeling growth of Indian cities having varied growth patterns. The application of ANN in deriving the transition rules in Cellular Automata modelling, in an objective manner, thereby reducing the human intervention. The optimum sizes and types of neighbourhood to be used in CA modeling have been recommended for the two Indian cities, one having dispersed growth pattern and another having compact growth pattern. A methodology for generating zoning maps depicting areas with different urban growth potential based on ANN has been proposed. The zonation maps will be very useful for urban planners. Thus, the work presented in this research may be envisaged as a contribution to the development of CA based modelling, with special reference to Indian cities.
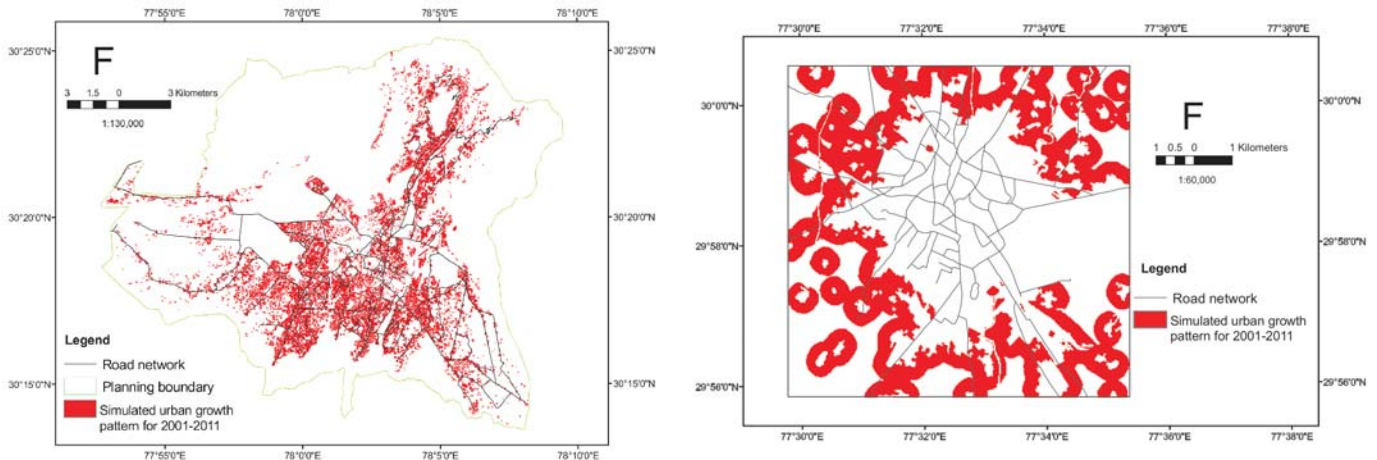
Simulated urban growth for 2011 using ANN based CA model for (a) Dehradun (b) Saharanpur city

Sandeep Maithani

Second EDUSAT Workshop- Distance Learning Program – Experiences and Future Plans

IRS has taken up the challenging and innovative idea of offering distance learning program i.e. EDUSAT based training program for the first time and conducted three such programs during 2007 – 2008 for more than forty universities / institutions at postgraduate level spread across India, training more than 2000 students. Most of the Distance Learning environments are of static nature with limited live and interactive activity, whereas this program is completely live and most effective way of interaction and therefore it is unique and innovative.

IIRS has organized second EDUSAT workshop in "Distance Learning Program – Experiences and Future Plans" for one day on March 20, 2009 with an objective to review the experiences gained from three courses conducted during 2007 – 2008, address the issues on course structure, duration, time slot and improvement needed for future programs, feedback from participating Institutions / Universities and plan to expand the next training course with wider participation of universities.

The workshop was conducted with technical presentations on technological trends and applications (by Shri Pradeep Kaul, Joint Director, CEC), Train-net Management System for better interactivity between teaching end and classroom as compared to existing VLC based LMS system (by Shri H.H. Vaghani, DECU) and live and interactive distance learning programs-experiences of IIRS outreach program (by Shri P.L.N. Raju, IIRS), followed by feedback and suggestions from university faculty (i.e. coordinators at the classroom side) and students of EDUSAT programs. More than 100 participants have attended the workshop, which includes university coordinators (existing and

Workshop participants of EDUSAT Distance Learning Program

new), invitees, IIRS faculty and students.

University coordinators appreciated and acknowledged the efforts of IIRS and NRSC, ISRO/NNRMS for providing an opportunity to participate in EDUSAT training program. The following points have been pointed out to consider for future programs:

- All the participating universities and new universities like to continue in the future IIRS EDUSAT training courses

- Lectures / presentations in multi lingual mode, if possible.

- EDUSAT program is benefiting as the participants are exposed to National level operational activity in RS & GIS

- National level calendar for IIRS EDUSAT Program needs to be worked out.

- UGC mandatory guidelines for participation in EDUSAT programs

- Motivation/ incentive for University Coordinators

- Run the EDUSAT training program twice in a year

- Standardization of evaluation procedure for awarding certificates

- Compulsion of attendance to all registered participants

- Pod casting of EDUSAT training programs, if possible

Inauguration of EDUSAT Workshop and Keynote address by Chief Guest Dr. V.Jayaraman, Director, NRSC

Dr. V. Jayaraman, Director, NRSC had inaugurated the workshop and delivered the keynote address to the participants. Dr. V.S. Hegde, Director, EOS gave inaugural address and gave emphasis on NNRMS capacity building activities. Shri Pradeep Kaul released the EDUSAT course material. In the evening Dr. V.Jayaraman, Dr. V.S. Hegde, Dr. V.K. Dadhwal, Shri Pradeep Kaul, Dr. Anjana Vyas, Professor of CEPT University and Dr. M.S. Nathawat, Head, Remote Senisng Centre of BIT, Mesra and Shri P. L. N. Raju as panelists provided their views and directions for continuation of EDUSAT program in 2009-10. Director, NRSC was kind enough to announce that sample data can be provided to the universities participating in the EDUSAT program. The program ended with vote of thanks to all concerned for the successful organization of the workshop.

P.L.N. Raju

RISAT-UP Training Course on Radar Remote Sensing and Applications

With impending launch of the first Indian Radar Imaging Satellite (RISAT) in 2009, which will provide easy access to C-band SAR data in a variety of imaging modes, polarizations and look angles to the Indian users, ISRO/DOS has planned a series of Radar Remote Sensing Courses under RISAT-Utilization Programme to enhance the capability of the Indian users in encashing the benefits of SAR data for natural resources mapping and disaster monitoring. RISAT-UP has planned training courses at various levels for catering to the need of the scientists/researchers working at different levels. To begin with, a number of 2-week training courses on Radar Remote Sensing and Applications are being conducted at three different ISRO/DOS centres namely at Space Application Centre, National Remote Sensing Centre, and Indian Institute of Remote Sensing.

After successfully conducting four general training courses in Radar Remote Sensing and Applications and one advanced training course in Interferometric and Polarimetric SAR under JEP-Microwave Programme, IIRS feels proud and privileged to conduct the second training course of the RISAT-UP training series on Radar Remote Sensing and Applications during March 16-27, 2009.

Twenty four course participants from 20 Govt. organizations located in northern, eastern and north-eastern regions of India had participated in this course: 4 from various ISRO centres, 4 from RISAT existing collaborators, 6 from State Remote Sensing Centres, 4 from Central Government organizations (namely Central Water Commission, Soil and Landuse Survey of India, and Forest Survey of India), and 6 from Educational and Research institutes under Govt. of India.

The course was designed to cover from the principles of radar remote sensing to SAR data processing, analysis, and applications in various thematic areas, overview on various SAR Systems with emphasis on RISAT Mission, RISAT data products, processing techniques and possible application areas, and advanced topics like Interferometric SAR (InSAR) and Polarimetric SAR (PolSAR). A total of 23 lectures, 14

practicals/tutorials, and one interactive discussion on various issues related to RISAT-UP mission and miscellaneous technical clarification were conducted in this course. Some specialized lectures and practicals/tutorials on RISAT Mission, RISAT data products, SAR Signal Processing, advanced PolSAR data processing techniques, Radar Scatterometry, Snow-cover Mapping and Oceanographic Applications, were covered by the eminent scientists/professors from Space Application Centre (SAC), Ahmedabad, Advanced Data Processing and Research Institute (ADRIN), Hyderabad, National Remote Sensing Centre (NRSC), Hyderabad, IIT Mumbai, and IIT Roorkee.

A hard-copy lecture notes volume for immediate consultation after the lectures and practicals/tutorials was provided to the course participants during the course and a digital volume of the course materials was sent to them after the completion of the course. A CD containing free/open source software tools for SAR data selection, processing and analysis (DESCW, BEST and PolSARpro by European Space Agency, SARDA by Space Application Centre, Ahmedabad etc.) was also supplied to the course participants.

Group photograph of the course participants

Course participants at field-based measurements

R.S. Chatterjee

Fuzzy c-Means Classification of Multispectral Data Incorporating Spatial Contextual Information by using Markov Random Field

Remote sensing technologies provide a unique opportunity to map the real world phenomena in a much faster and economic way in comparison to the traditional ground survey methods. The continuous nature of geographical phenomena throws a typical challenge to prepare land use/land cover maps from remotely sensed data. Very often land cover class changes gradually from one to another, therefore in such condition it is difficult to define sharp boundaries between two land cover classes and fuzzy classification techniques can be used to represent such conditions. However the Fuzzy c-Means classifier (FCM), the most common fuzzy classification technique, does not incorporate the spatial contextual information, which can be useful for further improvement in fuzzy classification results. Markov Random field (MRF) is a mathematical toolbox which characterizes the spatial contextual information in terms of smoothness prior assumption and incorporation of contextual information helped to improve the classification result for hard classifiers.

In the present study an algorithm called contextual FCM classifier was developed by using the MRF model and its performance was justified in comparison to the standard FCM algorithm in the context of wetland mapping. The contextual FCM and FCM classifiers were used on AWiFS and LISS-III data with different spatial resolutions i.e. 60m and 20m respectively. For the purpose of validation soft reference data was generated from fine resolution LISS-IV data (5m) using Support Vector Machine (SVM) classifier. The applicability of Euclidean and Mahalanobis norm in contextual FCM classifier were also judged in the context of wetland mapping. The results of different classification techniques were validated using seven different accuracy assessment tools, namely, Root Mean Square Error (RMSE), Pearson's Product Correlation Coefficient (r), Fuzzy Error Matrix (FERM), Sub-Pixel Confusion Uncertainty Matrix (SCM), MIN-PROD, MIN-MIN and MIN-LEAST composite operators with respect to the soft reference data. The results suggest that proposed contextual FCM classifier can improve the fuzzy classification results by incorporating spatial contextual information for remotely sensed data. Therefore it was also found that for contextual FCM classifier Euclidean norm performs better in comparison to the Mahalanobis norm.

Wet Land   Open Land   Agricultural Land with Crop   Agricultural Land without Crop

(a)

0.0   μ   1.0
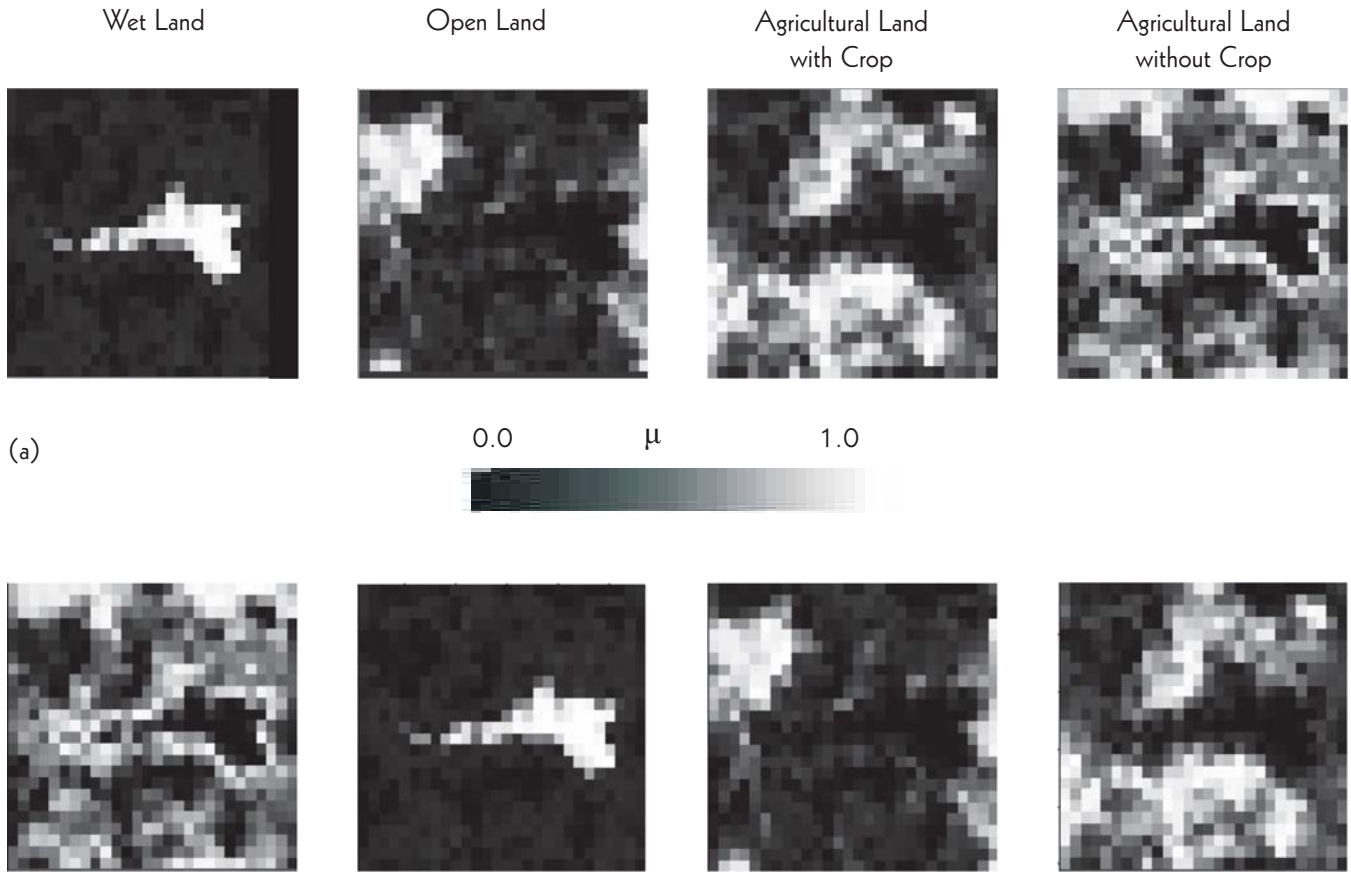
(b)   Figure (a) Fraction images of FCM (b) contextual FCM classification (Gibbs) for AWiFS data

Several experiments were performed to establish the suitable Simulated Annealing (SA) technique for developed contextual FCM classifier. It was found that for contextual FCM classification of remotely sensed data Gibbs Sampler performs better than the Metropolis-Hastings algorithm. The contextual FCM classifier as the final outcome of this study will be useful for better representation of geographical phenomena with uncertain boundaries.

Amitava Dutta, M.Sc. GFM, 2009.

आन्तर–केन्द्र हिन्दी तकनीकी संगोष्ठी

भारतीय सुदूर संवेदन संस्थान में दिनांक 11 नवंबर, 2008 को एक दिवसीय आन्तर–केन्द्र हिन्दी तकनीकी संगोष्ठी का आयोजन किया गया संगोष्ठी का शीर्षक **सुदूर संवेदन के उन्नत आयाम** था। संगोष्ठी में कुल 21 शोधपत्र प्रस्तुत किये गये। दस प्रतिभागियों को उनके उत्कृष्ट शोधपत्र के लिये पुरस्कार दिये गये। प्रथम पुरस्कार डा0 शिवप्रसाद अग्रवाल, वैज्ञानिक, जलसंसाधन प्रभाग, आई.आई. आर.एस. को उनके शोधपत्र **वर्षा जल संचयन तकनीकः सुदूर संवेदन एवं भौगोलिक सूचना प्रणाली का उपयोग** के लिये दिया गया। द्वितीय पुरस्कार कुमारी उत्तरा पाण्डेय, शोध छात्रा, वानिकी एवं पारिस्थितिकी प्रभाग, आई.आई.आर.एस. को उनके शोधपत्र **दुधवा राष्ट्रीय उद्यान में सूक्ष्मतरंग सुदूर संवेदन द्वारा वनों के जैवभार का आंकलन** के लिये दिया गया। श्री सुशील कुमार श्रीवास्तव को तृतीय पुरस्कार उनके शोधपत्र **ग्रेसः अंतरिक्ष से पृथ्वी की गुरूत्वाकर्षण शक्ति नापने के लिये एक अद्वितीय

शिव प्रसाद अग्रवाल

मिशन** के लिये दिया गया। इसके अतिरिक्त सात और पुरस्कार श्रीमती मीनाक्षी कुमार, डा0 वी. हरिप्रसाद (अहिन्दीभाषी), डा0 देबाशीष मित्रा (अहिन्दीभाषी), डा0 दयानन्द पंत, डा0 योगेश कान्त, डा0 विजय कुमार श्रीवास्तव एवं श्रीमती हिना पाण्डे को दिये गये। संगोष्ठी का

उद्घाटन श्री अनिल कुमार, उपनिदेशक एवं अध्यक्ष, राजभाषा कार्यान्वयन समिति, राष्ट्रीय सुदूर संवेदन केन्द्र, हैदराबाद द्वारा किया गया। संगोष्ठी की अध्यक्षता कार्यवाहक अधिष्ठाता डा0 जितेन्द्र प्रसाद ने की। संगोष्ठी आयोजन एवं कार्यक्रम संचालन डा0 सत्यप्रकाश सिंह कुशवाहा, प्रधान, वानिकी एवं पारिस्थितिकी प्रभाग द्वारा किया गया। संगोष्ठी में राष्ट्रीय सुदूर संवेदन केन्द्र एवं भारतीय सुदूर संवेदन संस्थान के वैज्ञानिकों ने बढ़—चढ़कर भाग लिया। श्रीमती मीनाक्षी सक्सैना, हिन्दी अधिकारी, एन.आर.एस.सी., हैदराबाद, श्री आशुतोष भारद्वाज, वैज्ञानिक व सदस्य, आई.आई.आर.एस. राजभाषा कार्यान्वयन समिति, श्री कृष्ण गोपाल, वरिष्ठ सहायक—ब एवं सदस्य सचिव, आई.आई.आर.एस. राजभाषा कार्यान्वयन समिति एवं श्री बसंत कुमार पयाल, वरिष्ठ सहायक—ब, भारतीय सुदूर संवेदन संस्थान ने संगोष्ठी में महत्वपूर्ण भूमिका निभायी।

सत्यप्रकाश सिंह कुशवाहा

सेवा निवृत

सेवा निवृत हो रहा हूँ
आप लोगों का स्नेह लिए जा रहा हूँ।
जिन्दगी के लम्बे समय
आप लोगों के साथ रहा हूँ

कभी खुशी कभी गम
यह महसूस कर रहा हूँ।
मैं दो शब्दों में दिल की बात
आप लोगों तक पहुँचा रहा हूँ।

सेवा निवृत हो रहा हूँ।
आप लोगों से बिछड़ रहा हूँ।
याद रहेगा यह पल
सोच कर खुश हो रहा हूँ।

भूल हुई हो कभी मुझसे
क्षमा आप सबसे मांग रहा हूँ।
हाथ जोड़कर आज मैं
आप लोगों से विदाई ले रहा हूँ।

सेवा निवृत हो रहा हूँ
आप लोगों का स्नेह लिए जा रहा हूँ।

सेवा निवृत हो रहा हूँ
आप लोगों का स्नेह लिए जा रहा हूँ।

भारत भूषण

Adieu

We bid fond farewell to Mr. Mohan Bora, Sr. Technician and Mr. Bharat Bhushan, Sr. Project Assistant, on attaining superannuation on 28 February, 2009 and wish them a happy, healthy and fruitful life ahead.

CALENDAR OF TRAINING COURSES FOR THE YEAR 2009

Sl. No	Course Code	Course Name	Entrance Requirements	No. of Seats	Starting Date dd.mm.yy	Passing Out Date dd.mm.yy	Course Fee			Apply by Date
							Govt. Sponsored	Fee Open Candidates	Foreign Trainees US $	
REMOTE SENSING & GIS MAPPING AND MONITORING OF NATURAL RESOURCES										
1.	C-PR	Basic Photogrammetry & Remote Sensing	Science/Engineering Graduate with mathematics up to higher secondary school level & 2 years experience (in service) / Post Graduates in relevant discipline.	5	02.03.09	29.05.09	**Nil**	18,000	1800	26.12.08
		Basic Photogrammetry & Remote Sensing	Science/Engineering Graduate with mathematics up to higher secondary school level & 2 years experience (in service) / Post Graduates in relevant discipline.	**This is part of PG Diploma and M.Tech. courses in various disciplines and its duration would be for 4 months (Module 1 of PG Diploma and M.Tech. courses)**						
2.	D-AS	Agriculture & Soils	M.Sc in Agriculture/ Soil Sciences/ Environmental Sciencs/ Geography /B.Sc. agriculture (4 years)	6	02.03.09	24.12.09	Nil	60,000	6,000	26.12.08
3.	D-FE	Forestry & Ecology	M. Sc in Forestry/ Environmental Science/ Ecology/ Botany/Wildlife/Geography/Zoology / B.Sc. Forestry (4 years)	6	02.03.09	24.12.09	Nil	60,000	6,000	26.12.08
4.	D-GG	Geosciences	M.Sc./M. Tech. in Geology/ Geophysics/ Earth Sciences / Geography / B. Tech. B.E. (Civil Engineering)	6	02.03.09	24.12.09	Nil	60,000	6,000	26.12.08
5.	D-MS	Marine Sciences	M.Sc. in Marine Sciences/Earth Sciences / any Natural Science / Physics/ Atmospheric Science	6	02.03.09	24.12.09	Nil	60,000	6,000	26.12.08
6.	D-UR	Human Settlement Analysis	Post Graduate in Town & Country Planning / M.Sc. in Geography Civil Engg. or Architecture Graduates / B Planning	6	02.03.09	24.12.09	Nil	60,000	6,000	26.12.08
7.	D-WR	Water Resources	B.E. / B.Tch. / M.E. / M.Tech. in Hydrology / Civil Engineering /Agricultural Engineering/ M.Sc. in Geology. Graduate Engrs with 2 yrs experience (in service).	6	02.03.09	24.12.09	Nil	60,000	6,000	26.12.08
8.	D-DP	Digital Photogrammetry	M.Sc./M.Tech. Physics, Maths, App. Maths, Statistics, Geophysics, Meteorology, Oceanography, Gelogy, Geography or any Natural/Environmental Sc. or BE/B.Tech. Working Govt servants with Graduation in Science with 2 yrs experience. Science Graduates should have studied Mathematics up to graduation.	6	02.03.09	24.12.09	Nil	60,000	6,000	26.12.08
9.	+M RG	M.Tech. in RS & GIS in all the disciplines of the above Post Graduate Diploma Courses except D-DP	M.Sc./M.E. in Natural Sciences- Geography / B.E. (Civil) /B.Tech/ B.Arch. (Planning) /M.Planning / B Planning in First Class or Master in Computer Applications (with Science at Graduate level) + B.Sc. (4 years). Applicants should hold both UG and PG degrees in natural / basic sciences with at least two basic/ natural science subjects in UG. **Admission is based on entrance test.** Those who have valid GATE certificate can get direct admission, however IIRS would not provide any fellowship to such candidates.	10	02.03.09	25.2.2011	Nil 10,000 (Andhra Univ. Regn. Fee)	1,44,000+ 250 (Andhra Univ. Regn. Fee)	14,400+	28.11.08
GEOINFORMATICS : TECHNOLOGY AND APPLICATION										
10.	C-GG	RS and GIS in Geosciences	M.Sc. in Geology/ Geography with Remote Sensing experience	3	28.09.09	23.01.10	Nil	24000	2400	17.07.09
11.	C-GL	Land Information System	Post Graduate in Town & Country Planning/ M.Sc. in Geography with RS experience / B.E./ B.Arch. / B. Planning	3	28.09.09	23.01.10	Nil	24000	2400	17.07.09
12.	C-GA	RS and GIS in Agriculture and Soils	M.Sc. in Agriculture, Geography or equivalent with Remote Sensing experience	3	28.09.09	23.01.10	Nil	24000	2400	17.07.09
13.	C-GW	RS and GIS in Water Resources Management	B.E./M.E. in Hydrology/ Civil Engineering/ Agricultural engineering/ M.Sc. in Earth Sciences} with Remote Sensing experience	3	28.09.09	23.01.10	Nil	24000	2400	17.07.09
14.	C-GC	RS and GIS in Coastal Zone Management	M.Sc. in Marine Sciences/ Earth Science / any Natural Science with Remote Sensing Experience	3	28.09.09	23.01.10	Nil	24000	2400	17.07.09
15.	C-GF	RS and GIS in Forest Management	M.Sc. in Forestry / Wildlife / Environmental Science / Zoology / Botany / Ecology with Remote Sensing Experience	3	28.09.09	23.01.10	Nil	24000	2400	17.07.09
16.	D-GI *Joint IIRS-ITC Program*	Post Graduate Diploma in Geoinformatics	M.Sc./M.Tech. in Remote Sensing, Physics, Maths, Applied Maths., Statistics, Geology, Geophysics, Geography with Maths.upto graduation level or graduate in Civil Engg / Planning / Arch.. or working professionals with Maths upto graduation level and minimum experience of 2 yrs in the field of photogrammetry.	10	28.09.09	24.07.10	Nil	80,000 (Rs. 65,000 payable to IIRS + Rs. 15000 payable to ITC	Euro 3000	17.07.09

Sl.	Code	Course	Eligibility	No.	Commence	End	Deposit	Fee	Foreign	Last Date
17.	M-GI *Joint IIRS-ITC Program*	M. Sc. in Geoinformatics	M.Sc. in Physics/ Computer Science (or applications)/ Maths/ Natural Sciences, Geology, Urban & Regional Planning / B.Arch. / B.E. /B.Tech (Civil / Electronics/ Computers) + B.Sc. (4 years) in First Class. Applicants should have studied mathematics upto 10+2 level. **Admission is based on entrance test.**	10	28.09.09	25.03.11	Nil	1,20,000 payable to IIRS + Euro1250 payable to ITC +{Rs. 2,00,000 own expenditure for visit to ITC}	Euro 6250	17.05.09
			PROGRAMMES IN GEOINFORMATIC APPLICATIONS IN GEO-HAZARDS							
18.	D-GH *Joint IIRS-ITC Program*	PG Diploma in "Geo-Hazards" 3 Optional streams : Hydrometeorological/ Geological/ Environmental	M.Sc. in Natural Sciences, Earth Science, Urban & Regional Planning /M.E. / B.E /B.Arch/ B.Planning/ M. Planning / B.E. / B.Tech. in civil engineering. Applicants should have studied mathematics upto 10+2 level.	10	28.09.09	24.07.10	Nil	80,000 (Rs. 65,000 payable to IIRS + Rs. 15000 payable to ITC	Euro 3000	17.07.09
19.	M-GH *Joint IIRS-ITC Program*	M. Sc. in Geo-Hazards 3 Optional streams : Hydrometeorological/ Geological/ Environmental	P.G. in Natural Sciences, Earth Science, Urban & Regional Planning /M.E. / B.E /B.Arch/ B.Planning/ M. Planning Applicants should have studied mathematics upto 10+2 level. **Admission is based on entrance test.**	10	28.09.09	25.03.11	Nil	1,20,000 payable to IIRS + Euro 1250 payable to ITC + {Rs. 2,00,000 own expenditure for visit to ITC}	Euro 6250	17.05.09
	REMOTE SENSING APPLICATIONS : Theme Specific Orientation Course									
20.	O-DM	Overview for decision makers	Decision makers in organizations (with 10 years experience in service).	10	16.06.09	19.06.09	7,000	7,000@	700@	17.04.09
	INTERNATIONAL PROGRAMMES									
21.	S-RS	Short Course on Remote Sensing with special emphasis on Digital Image Processing (ITEC Sponsored)	Middle level officers	20	05.01.09	27.02.09	12,000	12000	1200	28.11.08
22.	S-GI	Short Course on Geoinformatics (ITEC Sponsored)	Middle level officers	20	28.09.09	20.11.09	12,000	12000	1200	28.07.09
	NNRMS ISRO SPONSORED COURSES : FOR UNIVERSITY FACULTY ONLY									
23.	N-GI	GIS Technology and Advances	P.G. in Science/Engineering Graduate	8	04.05.09	26.06.09	Nil	12,000	1200	27.02.09
24.	N-WR	RS & GIS Applications to Water Resources	B.E. (Civil), Agricultural Engineering, masters in Hydrology/Hydrogeology with 2 years teaching experience	8	04.05.09	26.06.09	Nil	12,000	1200	27.02.09
25.	N-FE	RS & GIS applications to Forestry/ Botany / Ecology / Wildlife / Environmental Science	P.G. in Botany/Ecology/Forestry/ Environment/ Zoology / Wildlife with 2 yrs. teaching experience at PG level	8	04.05.09	26.06.09	Nil	12,000	1200	27.02.09
26.	N-UR	RS & GIS Applications to Urban & Regional Planning	B.E.(Civil)/B. Arch./P.G. Planning / B Planning / PG Geography with 2 years teaching experience	8	04.05.09	26.06.09	Nil	12,000	1200	27.02.09
27.	N-PR	Cartography and Mapping	P.G. in Science/Geography with 2 years teaching experience	8	04.05.09	26.06.09	Nil	12,000	1200	27.02.09
28.	N-GG	RS & GIS Applications to Geosciences	P.G. in Science/Geography with 2 years teaching experience	8	04.05.09	26.06.09	Nil	12,000	1200	27.02.09
29.	N-GA	RS & GIS Applications to Agriculture and Soils	P.G. in Science/Geography with 2 years teaching experience	8	04.05.09	26.06.09	Nil	12,000	1200	27.02.09

Due to inadequate response any programme may be dropped or may be rescheduled.

+ M. Tech. is accredited by Andhra University. M. Tech. is offered in six major disciplines (Agriculture and Soils, Forestry and Ecology, Geomorphology and Geohydrology, Marine Sciences, Urban and Regional Planning and Water Resources).

@ Includes boarding and lodging.

NOTE: - If the date of commencement falls on holiday, course will start from next working day.

Sponsoring organizations are required to meet all expenses viz., traveling allowance, daily allowance, contingent expenses, medical expenses etc., for their candidates EXCEPT course fee. **However Sl. Nos. 20, 21 & 22 are paid courses for all**.

Govt. organizations include Central / State Government bodies / Autonomous Institutions and Universities and can **sponsor only permanent staff**.

Private & Self sponsored candidates have to pay full course fee prior to joining the course..

Security deposit (i) @ Rs. 2000/- in respect of Certificate Courses (ii) @ Rs. 4000/- in respect of PG Diploma Courses and (iii) @ Rs. 6000/- in respect of M.Sc./M.Tech. for Self Financed candidates, have to deposited/remitted one month prior to the commencement of the course, failing which seats would be offered to waitlisted candidates..

Boarding and lodging charges at IIRS Hostel comes to Rs. 2000 p.m. (approx.). Local candidates will be considered for hostel accommodation, only if available.

For further details, please contact:

Dean / Technical Staff Officer, Indian Institute of Remote Sensing (NRSC), Dept. of Space, Govt. of India, 4 Kalidas Road, Dehra Dun 248 001, UTTARAKHAND (INDIA)

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