One week International Workshop on Geoinformatics System Development
From 24th July to 28th July ,2017

Conducted by
Asian Institute of Technology, Bangkok, Thailand

Organized by
JIS College of Engineering ,
(An Autonomous Institution)
Block A, Phase III, Kalyani, Nadia, West Bengal, India

One week International Workshop on Geoinformatics System Development has been organised by JIS College of Engineering and Conducted by Asian Institute of Technology, Bangkok, Thailand from 24th July to 28th July ,2017. The entire workshop has been planned and guided by Mrs. Sila Singh Ghosh, VP, Corporate Relations, JIS Group and Dr. Malay R. Dave, principal JIS College of Engineering. The same has been inaugurated on 24th July with the opening speech by Dr. Malay R. Dave, principal JIS College of Engineering followed by the speech of Dr. Somsubhra Gupta, Dean – Academic Affairs, JISCE, Prof. Nitin Kumar Tripathi and Dr. Rajesh. One introductory session on geoinformatics by Prof. Tripathi was kept for the all stakeholder of JISCE to spread the basic knowledge on geoinformatics. Around 120 students and faculty members have participated in the inauguration program. The entire workshop has been coordinated by Sudipta Sahana, Asst. Professor, Department of CSE, JIS college of Engineering.

About Geoinformatics

Geoinformatics has emerged as a field of study that is focused on basic questions about the acquisition, storage, management, analysis and visualization of geographic information within Geographic Information Systems (GIS). Geoinformatics researchers develop new computational, visual analytical, and statistical methods to process, analyze and understand big geospatial and temporal data. Through the development of new theories and methodological tools, geoinformatics helps to support basis scientific enquiry as well as help address complex social and environmental challenges (e.g., climate change, public health, migration, transportation safety, and security). Geoinformatics research contributes to the development of various location-aware technologies such as Global Positioning Systems (GPS), the Internet of Things (IoT), mobile sensors, and remote sensing. Applied geoinformatics, in the form of geographic information system (GIS) and remote sensing software, is used to support research in an increasingly wide range of disciplines that include the arts, humanities, social sciences, natural sciences, health sciences, and engineering. The growing importance of geoinformatics beyond academia is evidenced not only by the proliferation of location-based services offered as phone and tablet apps and used by consumers everywhere, but also by the prominent role it plays in the daily activities of government agencies and private enterprises throughout the world. Geoinformatics have become central to planning, management and decision making for almost all the development projects.

Geoinformatics combines geospatial analysis and modeling, development of geospatial databases, information systems design, human-computer interaction and both wired and wireless networking technologies. Geoinformatics uses geocomputation and geovisualization for analyzing geoinformation.Advancement of these technologies contribute to daily activities of human being bringing in new dimension to one or the other aspect of social and economical development of individuals and societies. Images that bring detail information of your neighbors' backyard are delivered to your doorstep through very high-resolution remote sensing images taken few hundred kilometers away from earth surface.

With the accomplishment of India's indigenous satellite navigation system "IRNSS" and its augmentation system "GAGAN", Indian space programmes have taken another giant leap in the

domain of self-reliant aerospace and GNSS applications. This achievement has open up vast range of research opportunities in all engineering disciplines leading to an inter-disciplinary approach for solving our day to day challenges. The GNSS positioning accuracies will give a way to advent new and innovative applications in terms of location based services, Augmentation reality and internet of things (IoTs). Smart phones apps coming handy, holds as a powerful web services tool for real-time now-cast/ forecast of various physical quantities through sensors ranging from human health to environmental & upper atmospheric monitoring.

Big geospatial and temporal data has become infused into many aspects of our daily lives. Analysis of such data is used, for example, to better understand and manage natural and built environments, investigate the spread of disease, locate services, guide route selection or mine the big data of social media to understand human behavior, mobility and communication patterns. In response, worldwide expenditures on geospatial technologies are large and rapidly increasing.

About the Workshop

Geoinformatics has emerged as a field of study that is focused on basic questions about the acquisition, storage, management, analysis and visualization of geographic information within Geographic Information Systems (GIS). Geoinformatics researchers develop new computational, visual analytical, and statistical methods to process, analyze and understand big geospatial and temporal data. Through the development of new theories and methodological tools, geoinformatics helps to support basis scientific enquiry as well as help address complex social and environmental challenges (e.g., climate change, public health, migration, transportation safety, and security). Geoinformatics research contributes to the development of various location-aware technologies such as Global Positioning Systems (GPS), the Internet of Things (IoT), mobile sensors, and remote sensing.

Objectives

The primary objectives of the course are as follows:

a. to introduce the concept of Geographic Information System & Remote Sensing
b. to introduce the concepts of Global Navigation Satellite System (GNSS)
c. to use RS & GIS data for mapping, analyzing, visualization & decision making.

Course Details

- Introduction of GIS
  - Concepts of GIS, Functions and Components of GIS
  - Applications of GIS
  - GIS Functional Elements
- Introduction to Remote Sensing
  - Satellite Sensors and Systems
  - Digital Elevation Model
  - Applications of DEM
- Introduction to GNSS
  - GPS Segments
  - GPS Error Source, DGPS, RTK-GPS
- Introduction to Open Source GIS
  - GIS Data Models, System Requirements – Software/ hardware
  - Open Source GIS, Introduction to QGIS
- Map Making
  - Geoprocessing Tools, Vector Data , Points, Lines, Polygons creations
  - Digitizing maps, Open Source Data, Google Earth
- GPS Data Collection
  - Importing GPS points via Epicollect5, Database Generation
  - Mobile based data collection and mapping
- Spatial Analysis
  - Contours, Slope, Aspect
  - DEM, 3D Analysis
- Web GIS
  - Publishing Data on Internet
  - GIS Web Application Development

Course Schedule: 24th – 28th July2017

Lecture No.	Day	Time	Course Details	Hours
	Day 1	10:00 AM - 10:30 AM	❖ Inauguration and Opening ceremony of the GIS workshop	30 Min
1	Day 1	10:30 AM – 12:30 PM	❖ Introduction of GIS • Concepts of GIS, Functions and Components of GIS • Applications of GIS • GIS Functional Elements	2 Hr
2	Day 1	1:30 PM – 2:30 PM	❖ Introduction to Remote Sensing • Satellite Sensors and Systems	1 Hr
3	Day 1	2:30 AM – 4:30 PM	❖ Introduction to Open Source GIS • GIS Data Models, System Requirements – Software/ hardware • Open Source GIS, Introduction to QGIS	2 Hr
5	Day 2	10:00 PM – 12:00 PM	• Digital Elevation Model • Application of DEM	2 Hr
6	Day 2	1:00 PM – 4:00 PM	❖ Map Making • Geoprocessing Tools, Vector Data	3 Hr
7	Day 3	10:00 AM- 12:00 PM	❖ Spatial Analysis • Contours, Slope, Aspect • DEM, 3D Analysis	2 Hr
8	Day 3	1:00 PM – 4:00 PM	❖ Map Digitization • Digitizing maps, Open Source Data, Google Earth	3 Hr
9	Day 4	10:00 AM – 12:00 PM	❖ Introduction to GNSS • GPS Segments • GPS Error Source, DGPS, RTK-GPS	2 Hr
10	Day 4	1:00 PM – 4:00 PM	❖ GPS Data Collection • Importing GPS points, Database Generation • Mobile based data collection and mapping	3 Hr
11	Day 5	10:00 AM – 12:00 PM	❖ Web GIS • Publishing Data on Internet • GIS Web Application Development	2 Hr
12	Day 5	1:00 PM – 4:00 PM	Future of GIS,Project Assignment & Quiz, Queries	3 Hr

Speakers Profile

Dr. Nitin Kumar Tripathi

Professor and Director-Special Degree Program

School of Engineering and Technology

Editor-in-Chief, International Journal of Geoinformatics

Asian Institute of Technology

Bangkok, Thailand

Dr. V Rajesh Chowdhary

Research Associate

Remote Sensing & Geographic Information Systems

Asian Institute of Technology

Bangkok, Thailand

Nitin Kumar Tripathi

Education

DEGREE	YEAR	INSTITUTION
B. Tech. (Civil Engineering)	1984	National Institute of Technology, Warangal, India
M. Tech. (Remote Sensing)	1987	Indian Institute of Technology (I.I.T.) Kanpur, India
PhD (Remote Sensing and GIS)	1995	Indian Institute of Technology (I.I.T.) Kanpur, India

Positions held

Total Experience: **29 Years 4 Months** (Around 30 years)

Year	Organisation	Designation	Duties
2014-onwards	Asian Institute of Technology, Thailand	Professor	Teaching and Research
2001 – 2013	Asian Institute of Technology, Thailand	Associate Professor	Teaching and Research
2000 – 01	Asian Institute of Technology, Thailand	Assistant Professor	Teaching and Research
1999 (Jan–June)	Asian Institute of Technology, Thailand	Visiting Faculty	Teaching and Research
1994-99	Indian Institute of Technology, Kanpur, India	Assistant Professor	Teaching and Research
1989-94	Indian Institute of Technology, Kanpur, India	Lecturer	Teaching and Research
1988-89	National Institute of Technology, Allahabad, India	Lecturer	Teaching and Research

Special honors and awards

- **NATIONAL MERIT SCHOLARSHIP 1977*By Government of Uttar Pradesh, India***

- **DAE YOUNG SCIENTIST AWARD – 1994 *The Dept. of Atomic Energy, India*** *conferred this award.*
- **OUTSTANDING TUTOR OF ENGINEERING GRAPHICS – 1996 *The Director, I.I.T. Kanpur*** *has conferred this certificate.*
- **AICTE CAREER AWARD FOR YOUNG TEACHER – 1996 *All India Council for Technical Education***, *India has conferred this award based on* ***teaching and research contribution*** *in last five years.*

- **BEST PAPER AWARD,** 3rd Map Asia 2004, Beijing, China, 2004.

- **BEST PAPER AWARD,** 25th Asian Conference on Remote Sensing 2004, Chiang Mai, Thailand.

- **BEST PAPER AWARD,** Int. Conference on Information Science and Applications, Beijing, China, 2006

- **Marquis Who's Who in World 2007 –** (25th Silver Anniversary Edition**)** (The best known, most trusted biographical resource on global achievers)

- **OCU Distinguished Scientist Award, 2007.**

  Osaka City University, Japan award is in recognition of scientific contribution and includes a fellowship to visit OCU for 3 months and conduct joint-research and other academic activities with the scientists of OCU.

Dr. V Rajesh Chowdhary

Research Associate

Educational Background

- PhD in Remote Sensing and GIS, Asian Institute of Technology, Bangkok, Thailand May 2015.
- M Tech in IT with specialization in Satellite Communications and Space System, International Institute of Information Technology, Pune , India, May 2011
- B Tech in Electronics and Communication Engineering, Jawaharlal Nehru Technological University Kakinada, India, May 2009

Scholarships & Awards Received

- Japanese Government Scholarship for pursuing PhD in Asian Institute of Technology.
- Selected for "**workshop and Conference on NeQuick**" at ICTP, Trieste, Italy during 4th– 8th May 2015 which was funded by UN office of Outer Space Affairs.
- Selected for "A COSPAR capacity building Workshop" & IRI-2015 Workshop at KMITL, Bangkok during 2nd -13th November 2015 which is funded by Committee on Space Research.

Projects

- Collaborative Research for the Regional Forum on Climate Change on the topic "**Developing new methods to monitor forest carbon in Asian tropical forests**" July 2016 – ongoing, funded by **French Government**.
- Project for developing course modules on "**GIS for Health & Geoinformatics for Coastal & Marine Resource Management**" January 2016 – ongoing, funded by **Erasmus + (EU)**.
- **Local ionospheric scintillation analysis (LISA)** using GNSS stations in Thailand, 2014 - 2016, funded by **US AOARD**.
- **Research on ionospheric Scintillations in Asia (RISA)** using GNSS, 2011- 2014, funded by **US AOARD**

List of Registered Students for this Workshop –

Sl No.	Name	Dept.	College Name	Year of Passing
1	ANIKET SANTRA	CSE	JISCE	2018
2	ANIK MANDAL	CSE	JISCE	2020
3	ANIRBAN SAHA	CIVIL	JISCE	2018
4	ANSHU KUMAR SHANDILYA	CSE	JISCE	2020
5	ARIJIT MAHATA	CIVIL	JISCE	2020
6	ARIJIT PAUL	CIVIL	JISCE	2018
7	ARITRA CHAKRABORTY	CSE	JISCE	2018
8	BISHAL CHAKRABORTY	CSE	JISCE	2018
9	ISHITA SAHA	CIVIL	JISCE	2018
10	JOYDIP MONDAL	CIVIL	JISCE	2019
11	JYOTI SAHA	CIVIL	JISCE	2019
12	MD MAHMOOD	CIVIL	JISCE	2019
13	MONISH MUKUL DAS	CSE	JISCE	2018
14	NIRMAL CHANDRA SAHA	CSE	JISCE	2018
15	PAROMITA MITRA	ECE	JISCE	2019
16	PRATIK KAR	CSE	GKCEM	2019
17	PRITAM KUMAR DAS	CSE	JISCE	2018
18	PRITAM SINGH	CIVIL	JISCE	2019
19	PUSHKAR ANAND	CIVIL	JISCE	2019
20	SANDIP DAS	CSE	JISCE	2018
21	SHOUVIK BANERJEE	CIVIL	JISCE	2019
22	SHUBHRANGSHU BASAK	CSE	JISCE	2018
23	SIDDHANT SATYAM	CIVIL	JISCE	2019
24	SREEJA CHOWDHURY	CSE	JISCE	2018
25	SUVAM BASAK	CSE	JISCE	2018
26	SWAGATAM SANYAL	ECE	DSDEC	2019
27	SWARUP TALUKDAR	CSE	JISCE	2018
28	SWIKRITI GUCHHAIT	CSE	JISCE	2018
29	SUCHARITA MAITY	ECE	JISCE	2018
30	UTTIYA MUKHERJEE	CSE	JISCE	2018
31	AMIT SAHA	ECE	JISCE	2018

Projects in implementation stage after this workshop:

1. **Automatic Weather Station (AWS)**

- Establishment of network of AWS system at JISCE, in which we will install 3 weather stations in and around Kalyani accordingly, to get the online real-time data visualization at Crinnotech Center. We will focus on essential parameters namely, Temperature, Rainfall, Humidity, Wind Direction & Speed etc. This data which will be collected overtime will be used to model and predict the various physical parameters.

2. **Smart Village**

- We have a concept paper of smart village which involve various level of functions to be included at Village level. Primarily it will focus on establishing Telemedicine center, Solar energy generation & distribution, Water treatment, Waste to Energy Conversion etc. JISCE can help in securing budget from various MP's or Ministries so that we can establish the prototype. This can be done Phase - 1, our team of experts will visit that particular village & recommend the technologies needed for the implementation based on ground realities and phase -2 , we will develop and demonstrate the technology.

3. **Water Treatment for Drinking Purpose**

- We can establish huge water treatment plants which can intake lake, pond, river, sewerage water to convert into drinking water. This will resolve the fluoride contamination in the ground water.

4. **Land Information System & Suitable Location of Specific Purpose**

- We can jointly discuss with representatives of districts and officers to know the ground problems of the village and we can establish a GIS based database for various layers of the districts e.g., land cover land use, high resolution UAV imagery datasets, Underground water lines, electric lines, transportation lines and railway lines. All databases of the district at one place using GIS technologies. We can give best suitable location for garbage dumping sites, industry setup etc.

5. **App Development**

- We can develop GIS based Mobile application for various necessities at provincial level, it may vary from health facilities, education establishments, service request, garbage collection points, waster disposal site.

Some Pictures of the event –


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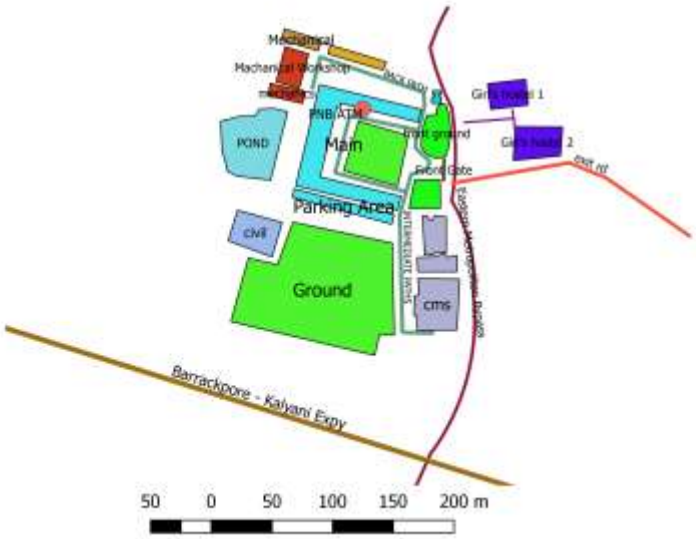
Some Pictures of assignment done by students during workshop –

JIS COLLEGE OF ENGINEERING



Legend

- Exprees WAY
- JIS Exit Road
- Hostel paths
- Yards
- Gates
- Outside roads
- Girls' hostel
- Civil
- ATM
- WAYS
- Ground
- Temple
- Pond
- Mechanical Workshop
- Mechanical Dept.
- CMS Builiding
- Chemical Dept.
- Main Building

Designed By - Ankit

Conducted by