University of Mysore

Centre for Geoinformatics Technology, Department of Studies in Geography

Manasagangotri, Mysuru 570006

A Report
on
RUSA Sponsored
Two Days Workshop on “Geoinformatics and Artificial Intelligence”

For GIS for Educations

Faculty Improvement Programme (FIP)
(For Faculties, Guest Faculties, Research Scholars and Students)

(12th and 13th December 2025)

“GIS for Educators”

"GEOINFORMATICS AND ARTIFICIAL INTELLIGENCY"
(Practical Oriented Hands-on Sessions)

Sessions	Morning Session		Afternoon Session	
Date / Time	10.30am - 12.00 Pm	12.00 pm – 01.30 pm	02.00 pm – 03.30 pm	03.30pm – 05.00pm
12th Dec 2025	Introduction to Python Programming	Google Colab Environment	Mastering Python Programming	Advanced Modules
Date / Time	10.00am - 11.30Pm	11.30pm – 01.00pm	02.00pm – 03.30pm	03.30pm – 05.00pm
13th Dec 2025	Concepts of Artificial Intelligence	Geo AI and Its Applications	Machine Learning for Remote Sensing	Building Detection from Satellite Imageries

Contact:
Prof. P. JAYASHREE
Convener of Programme,
Professor and Coordinator
Center for Geoinformatics Technology
Department of Studies in Geography
Manasagangotri Campus, University of Mysore
+91-9880112252, +91-9901259597

Total Intake of Programme: 60

Eligibility:
Faculties from UG/PG Colleges/Universities
Guest Faculties / Research Scholars/Students
from UG/PG Depts.

Invitation for Two Days
Workshop On

"GEOINFORMATICS AND ARTIFICIAL INTELLIGANCY (AI)"

“GIS for Educators”
Faculty Improvement Programme (FIP)
Sponsored by RUSA

(For Faculties, Guest Faculties, Research Scholars and Students.)
12th and 13th December 2025

Hosted by
CENTRE FOR GEOINFORMATICS TECHNOLOGY,
DOS in Geography, Manasagangotri Campus,
University of Mysore, Mysuru-06, Karnataka, India

Date: 12th and 13th December 2025
Time: 10.00am
Venue: Geo-Manasa Auditorium, DOS in Geography, MGM, UOM

To,

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Two Days Workshop on "Geoinformatics and Geoinformatics and Artificial Intelligence"
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Time table

University of  Mysore

Centre for Geoinformatics Technology, Department of Studies in Geography
Manasagangotri, Mysuru 570006.

RUSA Sponsored
Two Days Workshop on "Geoinformatics and Artificial Intelligence"

Date and Day	10:00 to 11:30 AM	11:45 to 1:30 PM	1:30 to 2:00	2:00PM to 3:30PM	3:30PM to 5:00Pm
12-12-2025 Friday	Introduction to Python Programming **Mr. Sathish Kumar S**	Google Colab Environment **Prof. Ramu**	Lunch Break	Mastering Python Programming **Mr. Shashi Kumar S**	Advanced Modules **Mr. Sumanth M**
13-12-2025 Saturday	Concept of Artificial Intelligence **Prof. Ramu**	GeoAi and its Applications **Dr. Vinay M**		Machine Learning for Remote Sensing **Mr. Sumanth M**	Building Detection from satellite images **Dr. Vinay M**

Template of the Participation Certificate

UNIVERSITY OF MYSORE

MALAVIYA MISSION TEACHER TRAINING CENTRE

MYSORE, KARNATAKA.

Certificate

This is to certify that

.....

.....*has participated in the*

2-Day Seminar/Conference on .....

.....*from*.....*to*.....

under RUSA sponsored Faculty Improvement Programmes organized by the University of Mysore, Mysore.

Prof. Jyothi H.P.
Director, MMTTC

Prof. N.K. Lokanath
Vice-Chancellor

Inaugural Session

Inaugural Address: **Prof N K Loknath, Vice Chancellor, University of Mysore.**
Chief Guest Address: **Prof. Ganesh Prasad, Professor and Vice Principal, NIE, Mysuru**
Date and Time: **12/12/2025**

The Centre for Geoinformatics Technology at the Department of Studies in Geography conducted a two-day workshop (12th and 13th December 2025) on the topic of 'Geoinformatics and Artificial Intelligency' under the "GIS for Educators" program, sponsored under RUSA.

The inaugural session began at 10 am. Dr. Ramya. Guest Faculty, Centre for Geoinformatics Technology, invited the dignitaries to the dais and commenced the inaugural session. Prof. P Jayashree addressed and welcomed the dignitaries, delegates, and everyone present to attend the workshop on Geoinformatics and AI. Ma'am, requested the delegates to make the best of the sessions being conducted. This was followed by lighting of diya. Soon after, Prof. N K Loknath, Hon'ble Vice Chancellor delivered the inaugural address. He requested students to apply Discipline, Dedication, and Determination to learn AI skills required in the field of Geospatial Sciences today. He further stressed the significance of AI, and how it would enable the students to stand apart from the crowd. He was felicitated by Prof. Ramu.

The Chief Guest for the inauguration was Prof. Ganesh Prasad, Vice Principal, NIE, Mysuru. Sir provided insights on the merits and demerits of AI. He emphasised the importance of critical thinking and the need for judicial use of Generative AI in the era where it takes centre stage. He further encouraged the students to learn the necessary skills for AI is the future.

Prof. Ramu remarked that AI is a revolution in the field of GIS, and everyone must take part in this revolution. He further encouraged students to participate and pick up the skills necessary in the domain at this time.

Prof Chandrashekara, Chairman, DoS in Geography, urged the delegates to adapt to the changes in the domain, but still have a soul to build upon.

The inaugural session came to an end, with a Vote of Thanks, delivered by Ms. Kruteeka, Guest Faculty, Centre for Geoinformatics Technology. She thanked all the dignitaries, delegates, students,

faculty and non-teaching staff for their contributions to the workshop.

Geoinformatics and AI workshop

Honourable Vice Chancellor inaugurated the workshop, Chief Guest Prof. Ganesh Prasad, Vice Principal, NIE, Mysuru, all the faculty members of the Centre for Geoinformatics Technology.

Session 1: **Introduction to Python Programming**
Speaker: **Mr Shashi Kumar S**
Date and time: **12/12/2025, 10:00 am to 11:30 am**

The first session was conducted by Mr Shashi Kumar S, Faculty of Computer Science, Maharani's Science College, Mysuru.

Introduction to Python Programming was a beginner's guide to Python Programming. Mr Shashi Kumar took the participants through the basic concepts of programming, including a brief history of Python Programming, Compilers and Interpreters, Basic Syntax and Semantics of Python.

Mr. Shashi conducted a session explaining the concepts of Variables, Identifiers, Data Types, Collections, Conditional Statements and Loops, which form the basis of Python. He explained each concept in detail and the use cases- along with the correct syntax.

He further explained about the different IDEs available to perform programming on, including VS Code, Jupyter Notebook, PyCharm, Spyder etc. He ended the session describing the difference between functions, modules, packages and scripts. He further explained to the participants the use of Flow Charts in

the field of programming.

Mr.. Shashikumar S introducing the python programming in the session

Session 2: **Google Colab Environment**
Speaker: **Prof. Ramu**
Date and time: **12/12/2025, 11:45 am to 1: 30 pm.**

The second session of the day was conducted by prof. Ramu, where he introduced the students to a cloud-based IDE – Google Collab. Google Collab is similar in nature to Jupyter Notebook, though it runs on a cloud platform, giving it more processing power and capabilities. This makes it a better option for programming in Geospatial Sciences as most of the work undertaken is heavy load and requires a higher processing power. The Google Collab environment provides three runtime models – a CPU, a GPU, and a Tensor Processing unit (Processing power increasing in the order mentioned).

Google Collab also allows users to share and collaboratively work on the same notebook and edit scripts on the go. It is extremely useful when dealing with large datasets, which is usually the case with remotely sensed datasets. It can also be used in collaboration with Google Earth Engine, which enables the user to import remote sensing data directly from the GEE libraries.

Google Collab can be used on mobile devices, making coding easy and efficient on the go, on any device, reducing the limitations of geospatial programming. It also has access to multiple libraries across the domain.

Prof. Ramu further explained the basic tools and code blocks in the Collab environment. He further explained the basic GUI of the website.

A lunch break commenced soon after this session.

Prof. Ramu Discussing the Google colab in the session

Session 3: **Mastering Python Programming**
Speaker: **Mr Shashi Kumar S**
Date and Time: **12/12/2025, 2:00 pm to 3:30 pm**

Building up on the session in the first half, Mr. Shashi conducted the practical session on Python using Google Colab. He demonstrated the creation and execution of code blocks on the website. He wrote and executed the code blocks including assigning variables a value and printing them. He further explained in depth about the concepts of Conditional Statements – defining if, elif, and else statements. He also defined and demonstrated the use of operators, including arithmetic, logical, assignment, membership, and bitwise operators. He further demonstrated the use of for and while loops and their importance in automation using Python.

The session covered all basic concepts, including variables, strings, operators, Lists, Tuples, Sets, Conditional Statements, and Loops. All of this was conducted on the Google Colab medium for ease of use and interoperability on various devices, including mobile phones. He further introduced us to other alternative IDE, including Pydroid 3 for mobile phones.

Mastering Python Programming session by Mr. Shashi Kumar S

Session 4: **Advanced Modules**
Speaker: **Mr Sumanth M**
Date and Time: **12/12/2025 3:30 pm to 5:00 pm**

The final session of the day was conducted by Mr Sumanth M, Consultant, Centre for Excellence in Land Administration and Management, ATI, Mysore.
His session included concepts on using numpy and geopandas on the Google Colab environment. He

explained in detail about the geopandas package used for geospatial analysis in the open-source domain. It encompasses the mathematical computational capabilities of pandas, and the concepts of geospatial sciences. He demonstrated the use of geopandas to print a map using a shapefile. This included, mounting your Google Drive on the colab platform, and uploading a shapefile on the drive.

He further demonstrated how to visualise a shapefile/or feature class using visualising parameters. He demonstrated how to find the coordinate system the dataset is in, and how to change the same to another projection.

By the end of this session, the participants were able to use google colab to upload and display shapefiles, create symbology, and change coordinate systems. He further also introduced the participants to other such modules including folium, geoAI, geospatial, numpy, rasterio, and plotly.

Advanced Modules from Mr. Sumanth M

Session 5: **Concept of Artificial Intelligence**

Speaker: Prof. Ramu

Date and Time: **13th December 2025, 10.30am to 12.00pm**

This session focused on introducing Artificial intelligence in day todays life, the meaning and definition of AI, it also enlighten the knowledge of data science, machine learning and deep learning.

Step by step how AI works demonstrated to the participants: Problem Identification, Data Collection, Data Pre-processing, Model Selection, Model Evaluation, Model Deployment and Integration, Model Monitoring and Maintenance exercises gave a practical awareness to the participants.

The different software's used in AI area familiarised to the participants: **Programming Languages:** Python, C, Java, and R. **Deep Learning Frameworks:** TensorFlow, Keras, PyTorch. **Machine Learning Libraries:** Scikit-learn (Python), XGBoost, MLlib. **Natural Language Processing (NLP) Tools:** NLTK (Python). **Computer Vision Libraries:** TensorFlow Object Detection API, OpenCV, and PyTorch. **Cloud**

Platforms: Google Cloud AI, Microsoft Azure **AI, Amazon Web Services (AWS).**

Applications of AI on: Healthcare, Cyber security, Customer Service and Support, Education, Social Media, Fraud Detection, Self-Driving Cars, Facial Recognition are discussed in the workshop. An algorithm is a step-by-step method of solving a given problem with finite number of steps were practiced from the students and preparing flowchart using different symbols and their meaning in AI programing were more essential part of the workshop.

High level language, low level language and assembly level languages and language translator: compiler and interpreter were discussed in the session.

Guido van Rossum who designed Python high level language and the different version of the python is also discussed in the session.

Prof. Ramu in practical session

Session 6: **GeoAI and its applications**

Speaker: Dr. Vinay M

Date and Time: **13th December 2025, 12.00pm to 01.30pm**

GeoAI (Geospatial Artificial Intelligence) is an interdisciplinary field that integrates **artificial intelligence (AI)** with **geospatial data science** and **Geographic Information Systems (GIS)**. As of 2025, it has evolved into a comprehensive framework for automating the extraction, classification, and analysis of large-scale spatial data.

The resource person briefly discussed GeoAI and its importance as an introduction part and then practical session on the below listed softwares were very much interesting and useful session for the participants of the workshop.

Online software like IDLE, Visual Studio Code (Microsoft), PyCharm (JetBrains), JupyterLab / Jupyter Notebook, Spyder, PyDev, Atom, Pyscripter, Google Colab (Google Colaboratory) are practically showed how to use these software's for AI programming.

Typical GeoAI methods: ML: Random Forest, SVM, XGBoost. **Deep Learning:** CNN, U-Net, ResNet, Transformers. **Spatio-temporal AI:** LSTM, Graph Neural Networks. Segmentation, Classification, object detection and instance segmentation using AI, how to train the AI with number of photos, images and getting the expected result from the AI was very much curious as well as interested to the participants.

Dr. Vinay Explaining the importance of GeoAI

Session 7: **Machine Learning for Remote Sensing**

Speaker: Mr. Sumanth M

Date and Time: **13th December 2025, 02.00pm to 03.30pm**

The resource person made an effort to teach how machine learning language can used for remote sensing data processing. Machine Learning (ML) has transformed remote sensing by enabling the automated, high-speed analysis of massive Earth observation datasets. It bridges the gap between raw spectral data and actionable insights for applications ranging from climate monitoring to disaster response. Land Cover & Use Mapping, Agriculture, Environmental Monitoring, Disaster Management, Geological Surveys.

Common ML Algorithms helps in Random Forest (RF). Support Vector Machines (SVM), Artificial Neural Networks (ANN), Deep Learning (DL) helps in Recurrent Neural Networks (RNN) **and** Transformers are favored for time-series data analysis. Data used for these analyses area Landsat, Setinel-2, MODIS, LiDAR for 3D, SAR for weather monitoring. Hyper spectral Instruments like AVIRIS provide hundreds of narrow spectral bands for detailed material identification.

Mr. Sumanth M. Demonstrating how Remote Sensing Data can be processed through Machine Learning Language

Session 8: **Building Detection from Satellite Images**

Speaker: Dr. Vinay M

Date and Time: **13th December 2025, 03.30pm to 05.00pm**

The last session of the workshop was on Building detection from satellite images using AI. Building detection from satellite imagery is a critical task for urban planning, disaster response, and environmental monitoring. Advanced deep learning models and hybrid optimization techniques have significantly improved the accuracy and speed of identifying these structures. **Deep Learning Architectures**, Hybrid **Models**: New frameworks like **SDBN-HCWO** (Secant Deep Belief Network-based Hyperbolic Cosine Whale Optimization) particularly in complex urban environments. **Segment Anything Model (SAM 2)**: Recent fine-tuning techniques allow SAM 2 to generalize across satellite imagery. Using the same methods trees, car parking, and potholes solar panels can also be identified.

Building footprints extracted from satellite images using Machine Learning Language

Dr. Vinay M in Practical Session of Building identification using remote sensing data

Valedictory function:

Valedictory function chaired by the coordinator Prof. Jayashree P, Prof. Ramu and Dr. Vinay M Shared the stage, Dr, Ramya R, Faculty in GIS hosted the function

Valedictory function started at 05.10pm on 13th December 2025. Prof. P Jayashree concluded the workshop with saying that this workshop will be more benefited to the students, research scholars and teachers to understand and get familiarise with the recent technologies and its importance. Prof. Ramu Shared his thoughtful says to the participants. Second year student Mr. Rahul and First year student Miss. Sneha F Manik gave a very good feedback on the workshop and both of them were asking to conduct the one week workshop on the same topics.

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Miss Sneha F Manik. First year student giving feedback on workshop

Mr. Rahul C Second year student giving feedback on workshop

At the last certificates were distributed to the participant.

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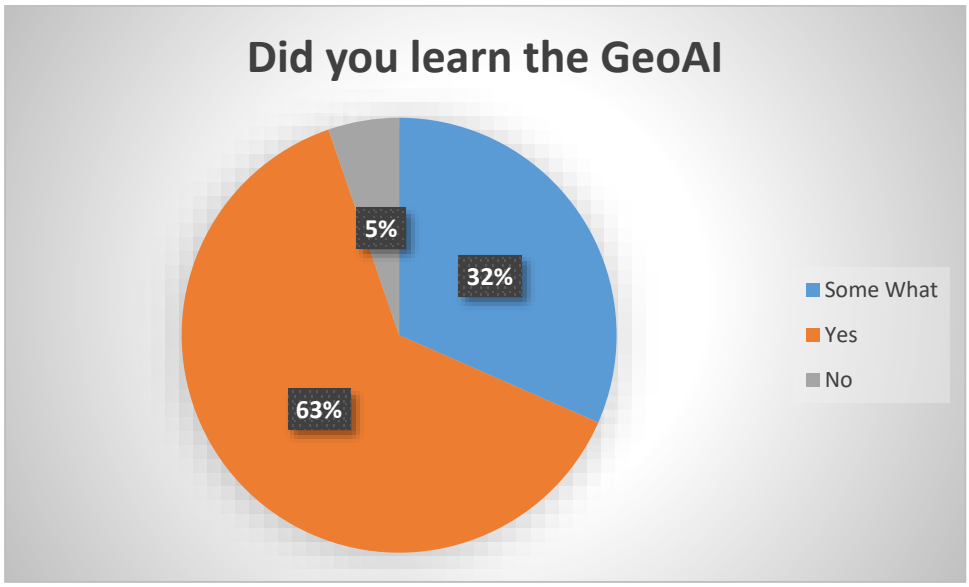
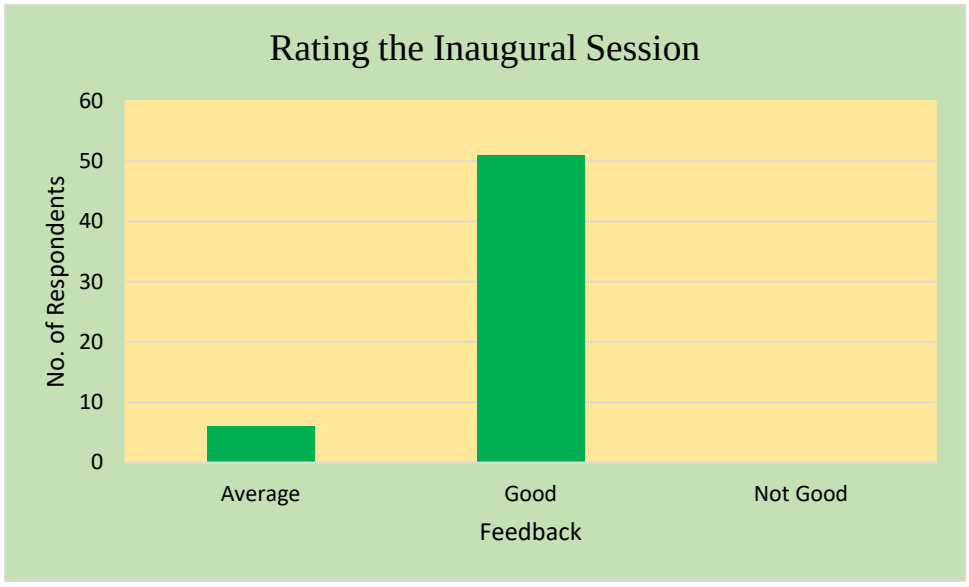
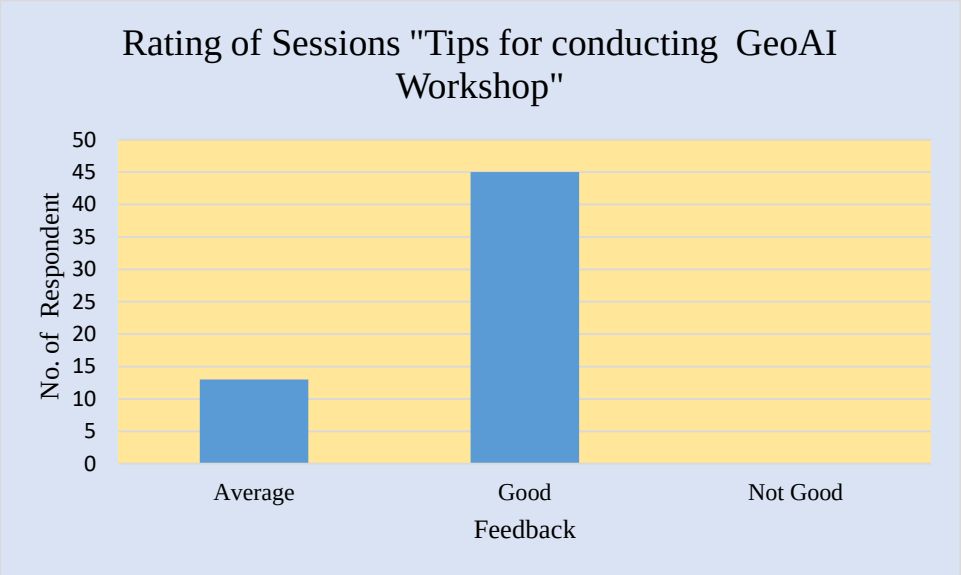
University of Mysore
RUSA Sponsored 2 Days Workshop on
"Geoinformatics and Artificial Intelligence"

Feedback from the workshop attendees, There were 57 participants gave their feedback the results shows as follows. The following is the graphical representation the responses from the participants.

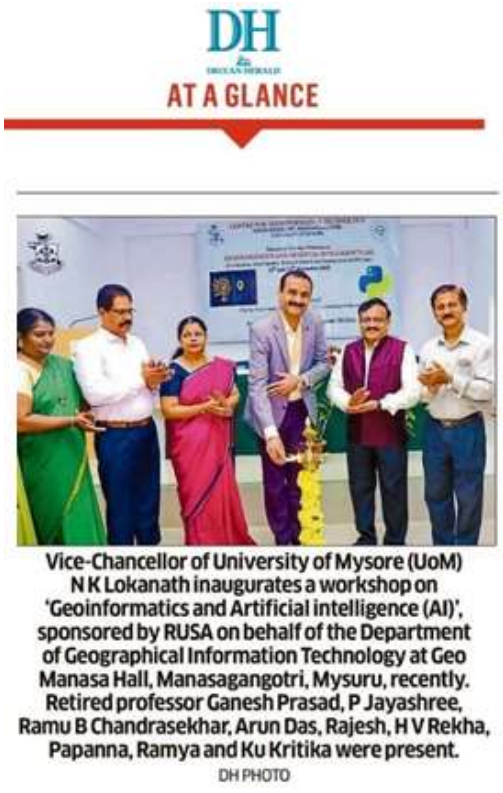



Did you learn something relavent to your research
5%
95%
Yes
No


Rating the Inaugural Session
No. of Respondents
60
50
40
30
20
10
0
Average
Good
Not Good
Feedback



Media coverage


DH
AT A GLANCE

Vice-Chancellor of University of Mysore (UoM) N K Lokanath inaugurates a workshop on 'Geoinformatics and Artificial intelligence (AI)', sponsored by RUSA on behalf of the Department of Geographical Information Technology at Geo Manasa Hall, Manasagangotri, Mysuru, recently. Retired professor Ganesh Prasad, P Jayashree, Ramu B Chandrasekhar, Arun Das, Rajesh, H V Rekha, Papanna, Ramya and Ku Kritika were present.
DH PHOTO


ಕನ್ನಡಪ್ರಭ

ಜಿಯೋ ಇನ್ಫರ್ಮ್ಯಾಟಿಕ್ಸ್, ಎಐ ಕುರಿತು ಕಾರ್ಯಾಗಾರ

ಮೈಸೂರು: ಮೈಸೂರು ವಿವಿ ಭೌಗೋಳಿಕ ಮಾಹಿತಿ ತಂತ್ರಜ್ಞಾನ ವಿಭಾಗವು ರೂಸಾ ಪ್ರಾಯೋಜಿತ ಜಿಯೋ ಇನ್ಫರ್ಮ್ಯಾಟಿಕ್ಸ್ ಮತ್ತು ಎಐ ಕುರಿತು ಎರಡು ದಿನಗಳ ಕಾರ್ಯಾಗಾರವನ್ನು ಜಿಯೋ ಮಾನಸ ಸಭಾಂಗಣದಲ್ಲಿ ಕುಲಪತಿ ಪ್ರೊ. ಎನ್.ಕೆ. ಲೋಕನಾಥ್ ಉದ್ಘಾಟಿಸಿದರು. ನಂತರ ಮಾತನಾಡಿದ ಅವರು, ಪ್ರಸ್ತುತ ಜಗತ್ತಿನಲ್ಲಿ ಕೃತಕ ಬುದ್ಧಿಮತ್ತೆ ಮತ್ತು ಭೌಗೋಳಿಕ ಮಾಹಿತಿ ತಂತ್ರಜ್ಞಾನದ ಪ್ರಾಮುಖ್ಯತೆಯನ್ನು ತಿಳಿಸಿದರು. ನಿವೃತ್ತ ಪ್ರಾಧ್ಯಾಪಕ ಗಣೇಶ್ ಪ್ರಸಾದ್ ಅತಿಥಿ ಭಾಷಣ ಮಾಡಿದರು. ಭೂಗೋಳಶಾಸ್ತ್ರ ಅಧ್ಯಯನ ವಿಭಾಗದ ಮುಖ್ಯಸ್ಥ ಪ್ರೊ.ಬಿ. ಚಂದ್ರಶೇಖರ್ ಅಧ್ಯಕ್ಷತೆ ವಹಿಸಿದ್ದರು. ವಿಭಾಗದ ಸಂಯೋಜಕಿ ಪ್ರೊ.ಪಿ. ಜಯಶ್ರೀ, ಪ್ರೊ. ರಾಮು, ಪ್ರೊ. ಅರುಣ್ ದಾಸ್, ಡಾ. ರಾಜೇಶ್, ಡಾ. ರೇಖಾ, ಡಾ. ಪಾಪಣ್ಣ ಕೃತಿಕಾ, ಡಾ. ರಮ್ಯ ಇದ್ದರು.

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