IEEE computer society
Hyderabad Chapter

IEEE Computer Society
Hyderabad Chapter IEEE
Hyderabad Section

Report on "Representation and topology – based clustering methods for spatial Data Analysis and Visualization."

Hyderabad Chapter Office Bearers

Mr. T. Vidyasagar [Chair]
Ms. Reena Dayal [Vice-Chair]
Dr. M. A. Jabbar [Vice- Chair, Student Activities]
Mr. G. Dileep Kumar [Secretary]
Dr. Rajanikanth Aluvalu [Treasurer]

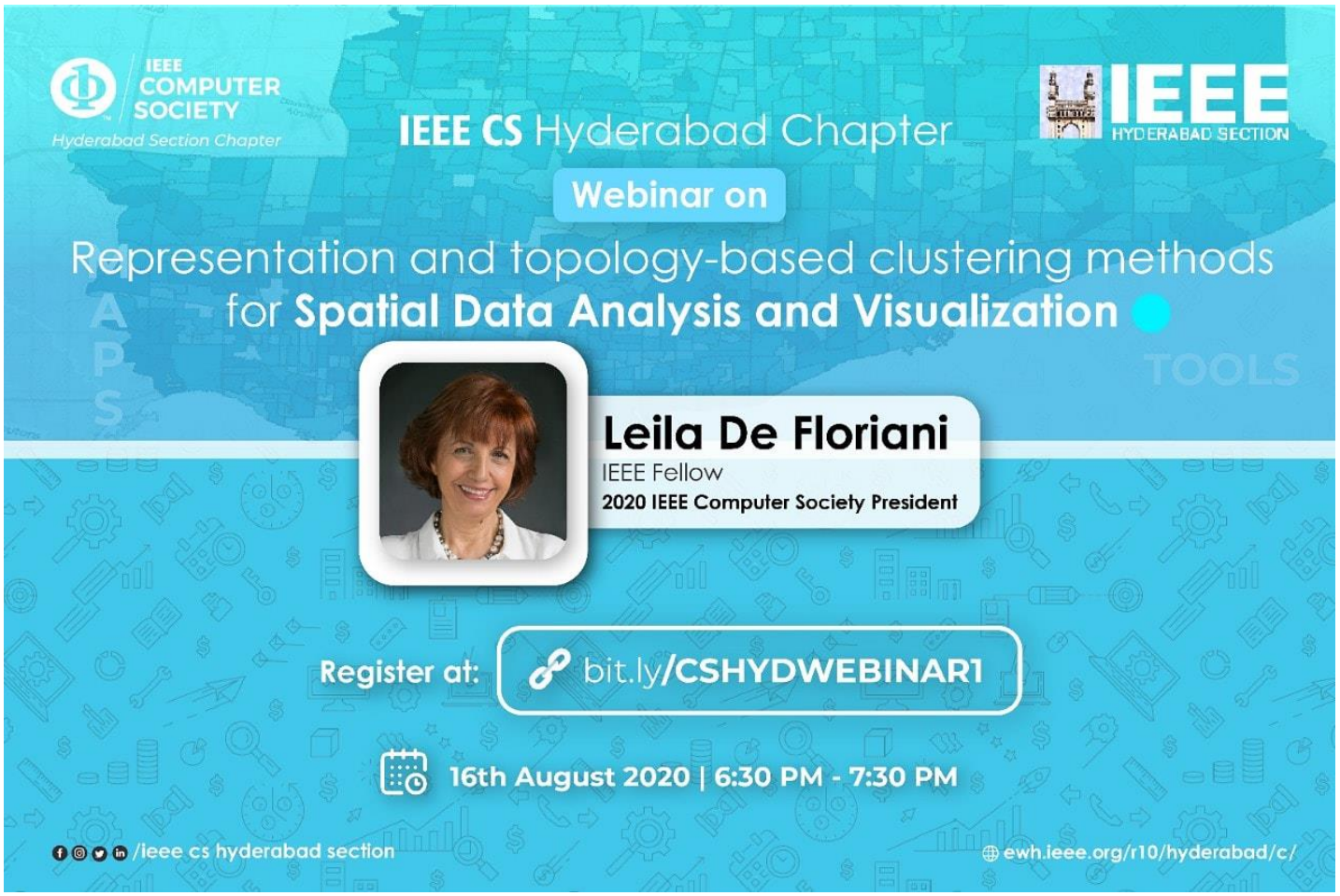
Date & Time: 16th August 2020 from 06:30 pm to 07:30 pm

Speaker Details: Leila De Floriani

IEEE fellow

2020 IEEE Computer Society President

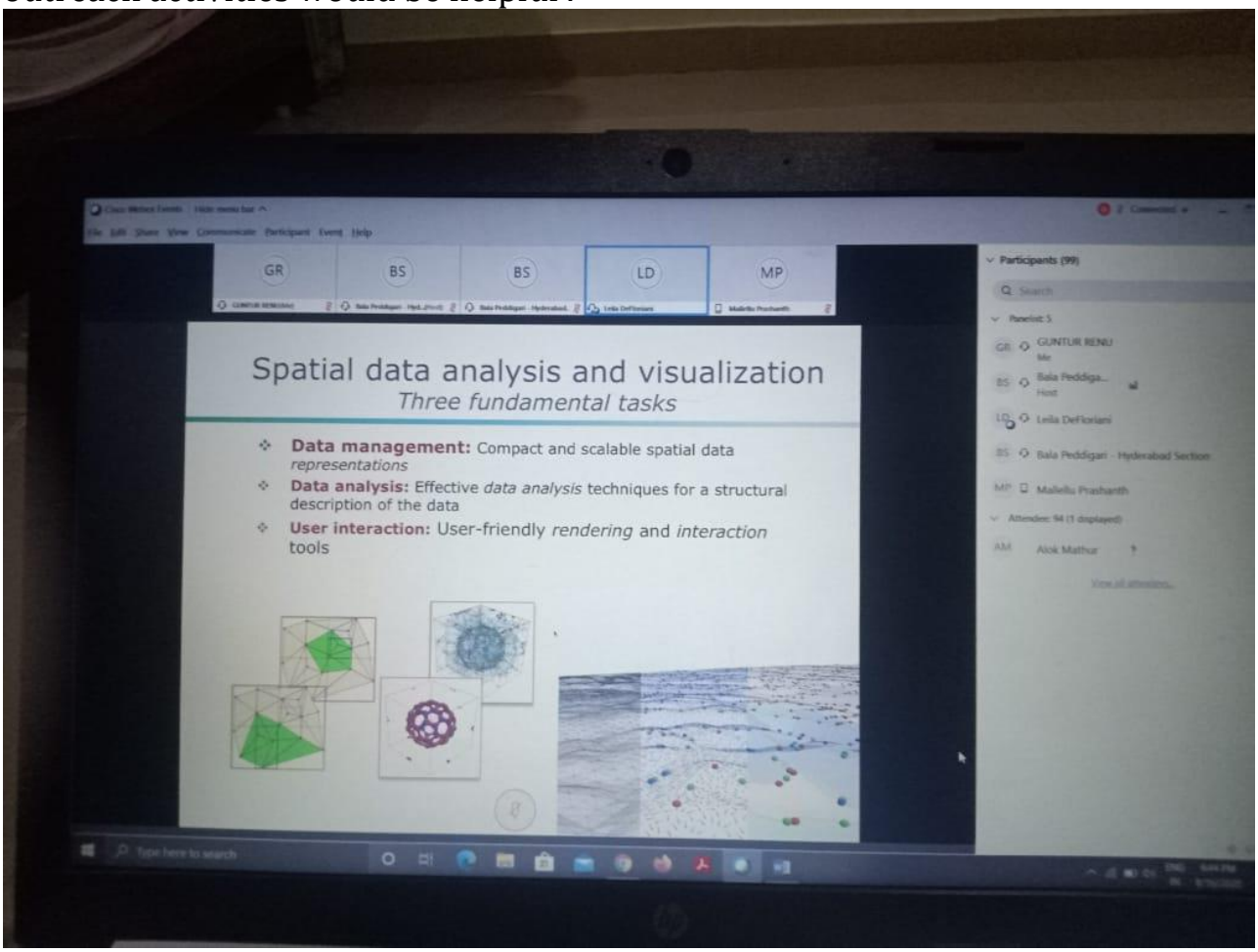
Description: The webinar "Representation and topology – based clustering methods for spatial Data Analysis and Visualization" is quite interesting and fascinating because there were no webinars related to this topic previously which at the first point have attracted a huge audience and Leila de floriani mam just awesome in delivering the content she wanted to in this session she first started her talk giving a small brief about her and her works which were inspiring to the young and upcoming generations.



Then she have started the session saying that geographic visualization, refers to a set of tools and techniques supporting the analysis of geospatial data through the use of interactive visualization. She said that spatial data analysis and visualization mainly includes three tasks such as

1. **Data management**
2. **Data analysis**
3. **User interface**

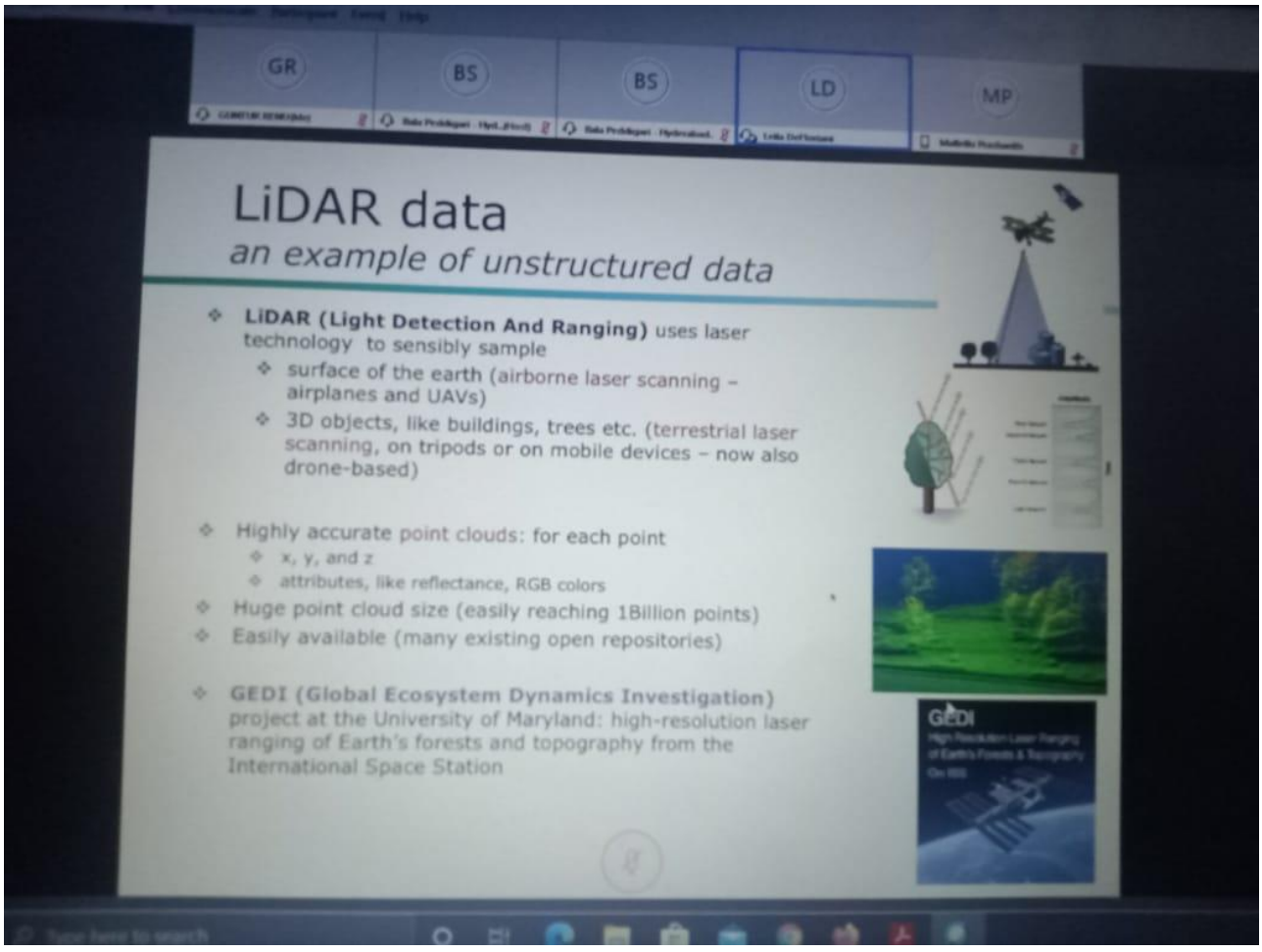
And she have clearly explained how the three tasks are inter related and how do they interpret she have also mentioned that Data Analysis is the process of bringing order and structure to collected data. It turns data into information teams can use but whereas Data visualization is the process of putting data into a chart, graph, or other visual format that helps inform analysis and interpretation. She also meant that geospatial tools to environmental problems of local significance, and to disseminate geospatial tools and knowledge to the larger island community through education and outreach activities would be helpful .



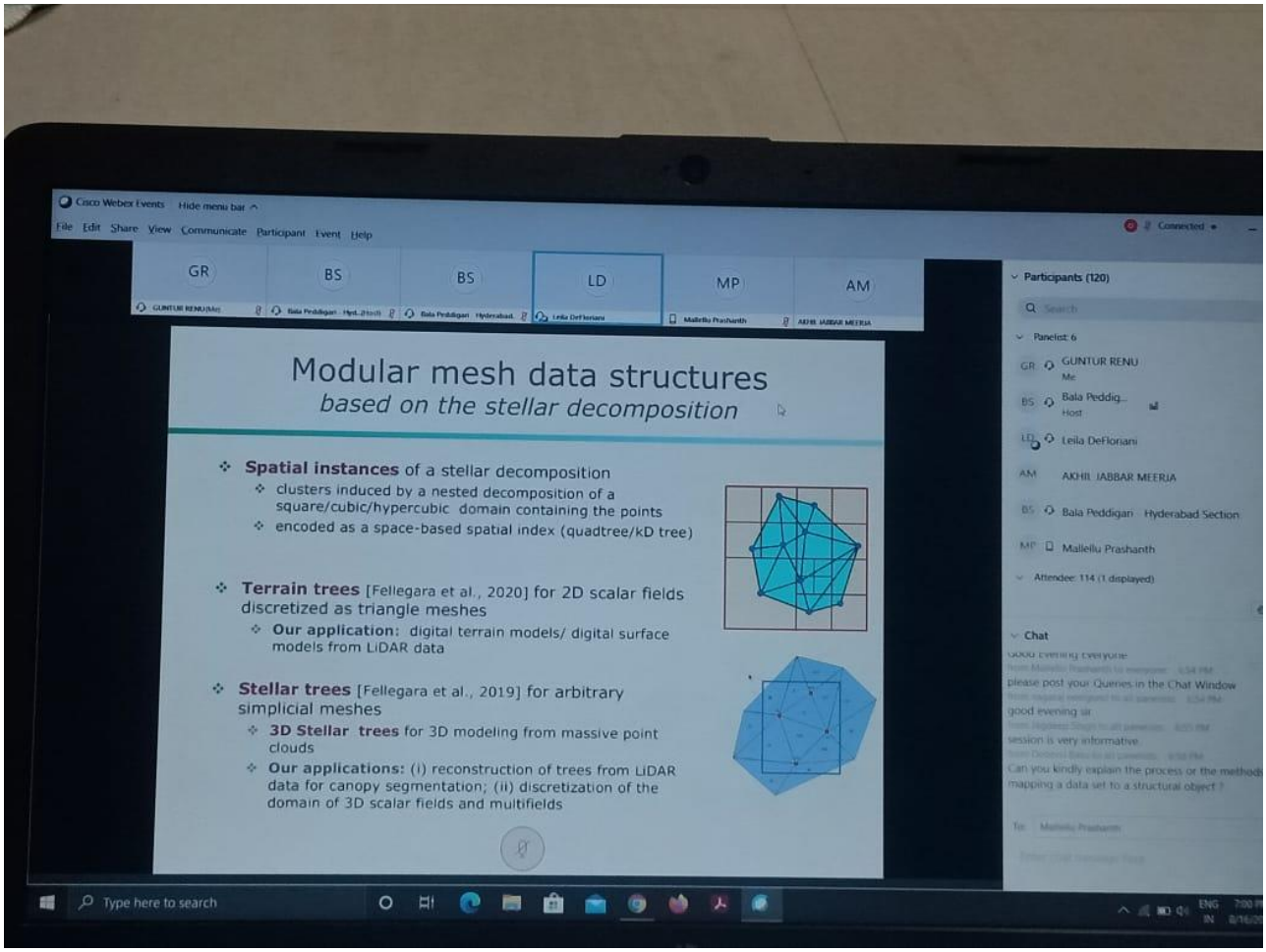
She have clearly explained about the LIDAR data which is Light Detection and ranging data which uses laser technology to sensibly sample

1. Surface of the earth(airborne laser scanning- airplanes and UAV's)
2. 3D objects like buildings, trees etc.(terrestrial laser scanning ,on tripods or on mobile devices – now also drone- based)
   She mentioned that this LIDAR data is an example of unstructured data and has a huge point cloud size(easily reaching 1 Billion points)

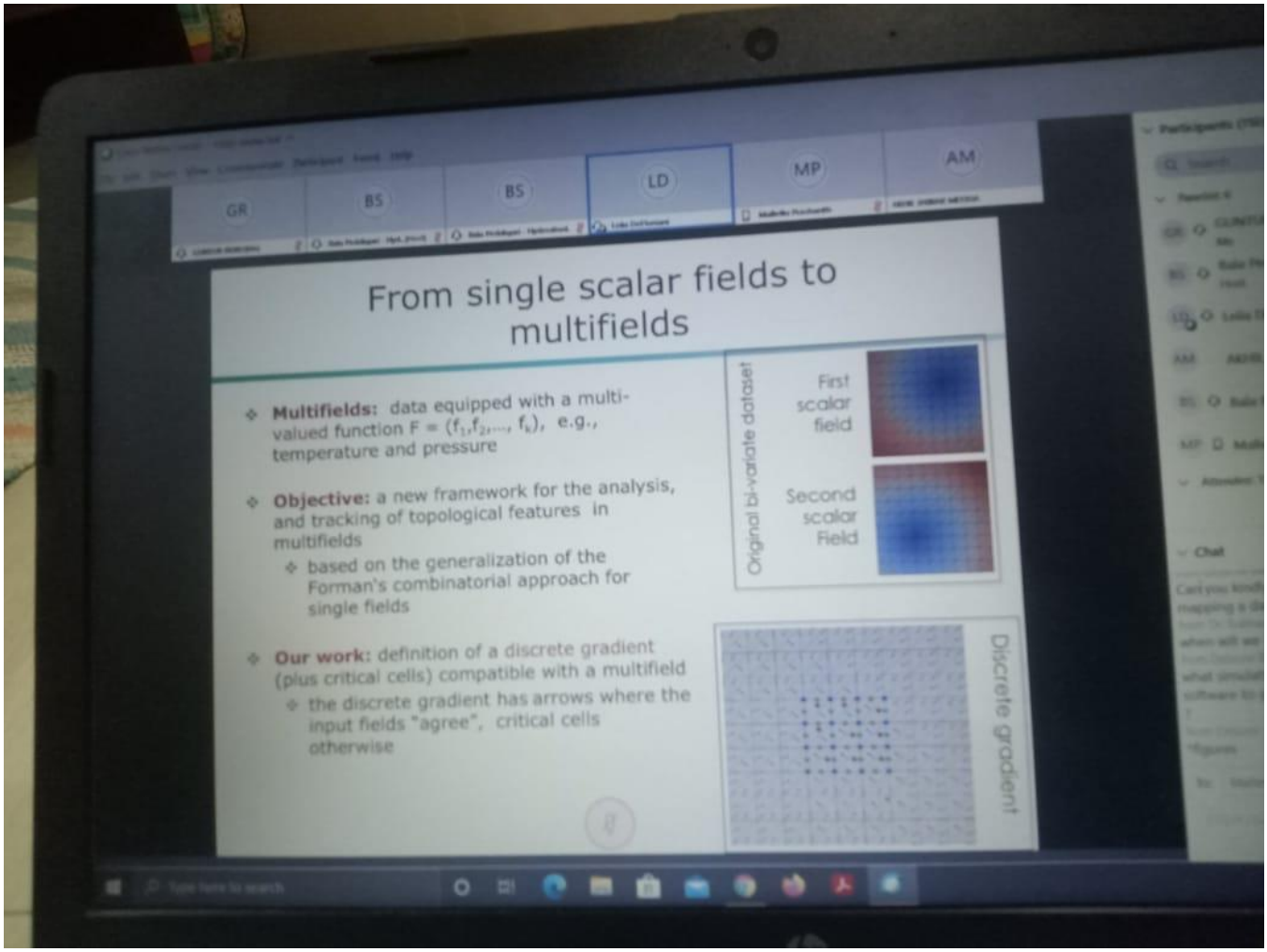
   She have also said that the GEDI(Global Ecosystem Dynamics investigation) project at the university of Maryland: high –resolution laser ranging of Earth's forests and topography from international space station .

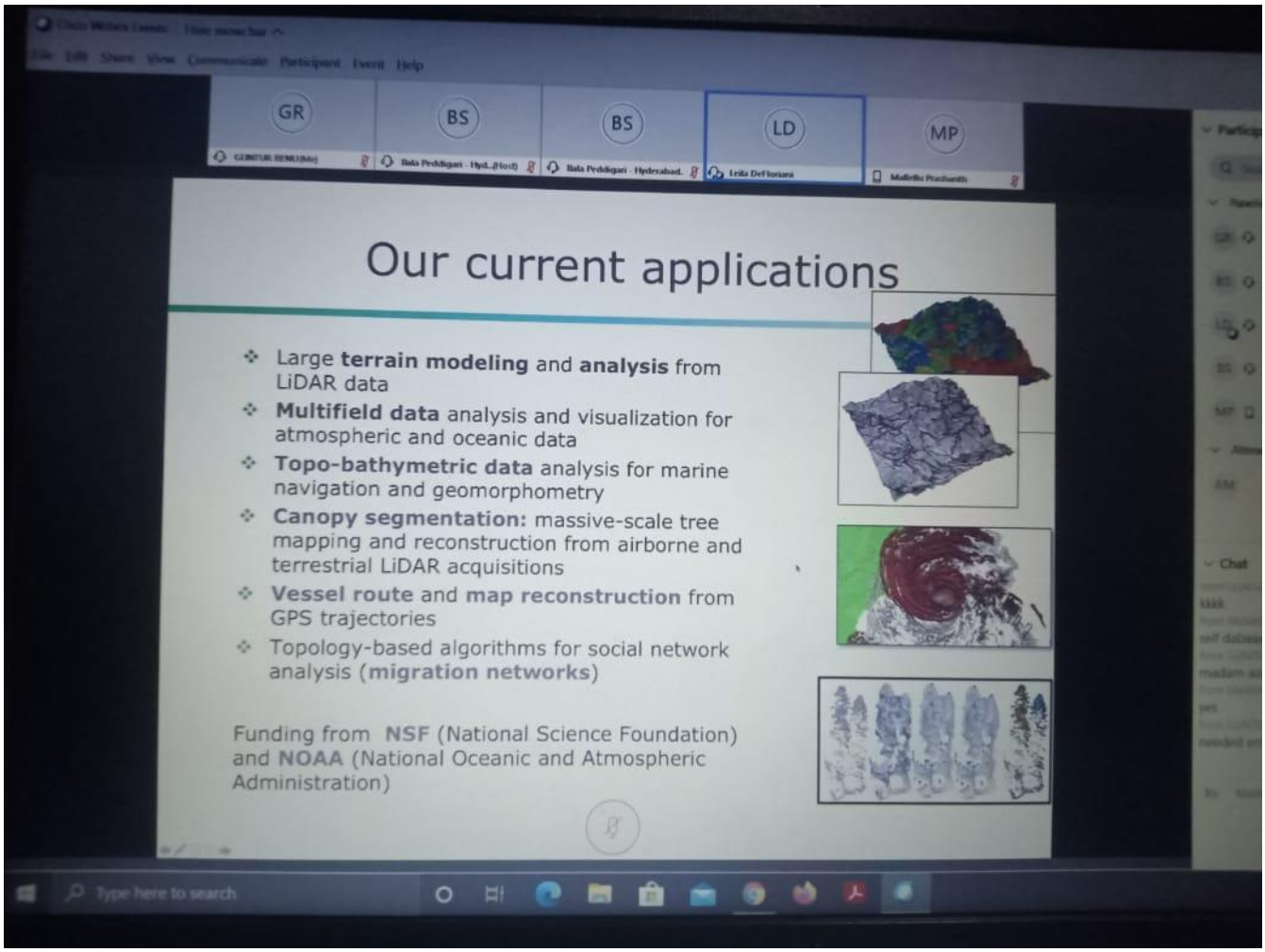


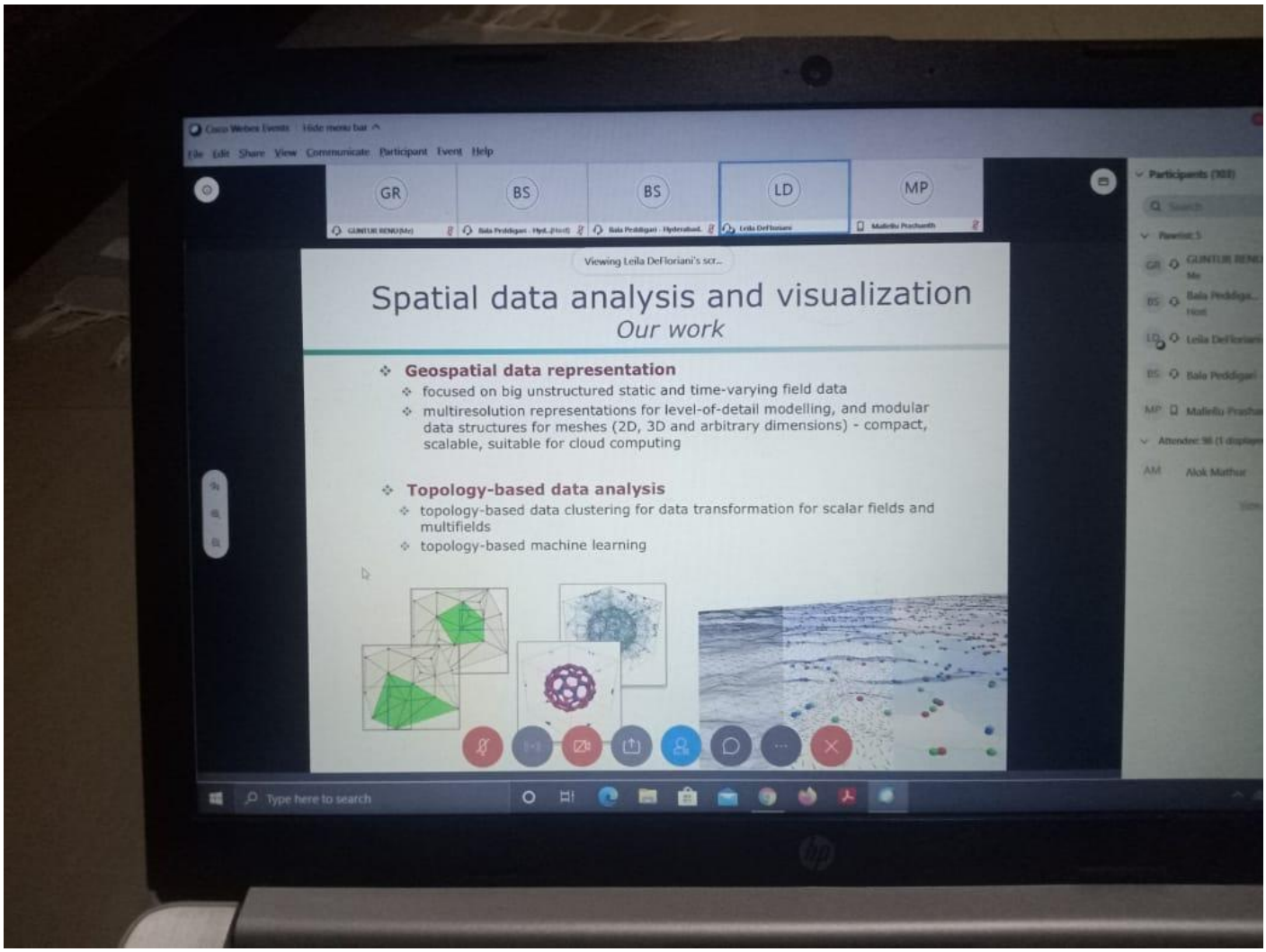
She have explained about the Modular mesh data structures based on the stellar decomposition which include the
Spatial instances of a stellar decomposition
Clusters induced by a nested decomposition of a square/cubic/hypercubic domain containing the points which is encoded as a space – based spatial index (quadtree/kD tree)
She gave brief and clear description about the Terrain trees as well as Stellar trees and their applications as well .
After the session ended we have shown the glimpse of IEEE CS Hyderabad section events during this pandemic and she was impressed and glad for the works being done and gave us good appreciations.
And the session ended with a question and answer session from the participants followed by the vote of thanks.

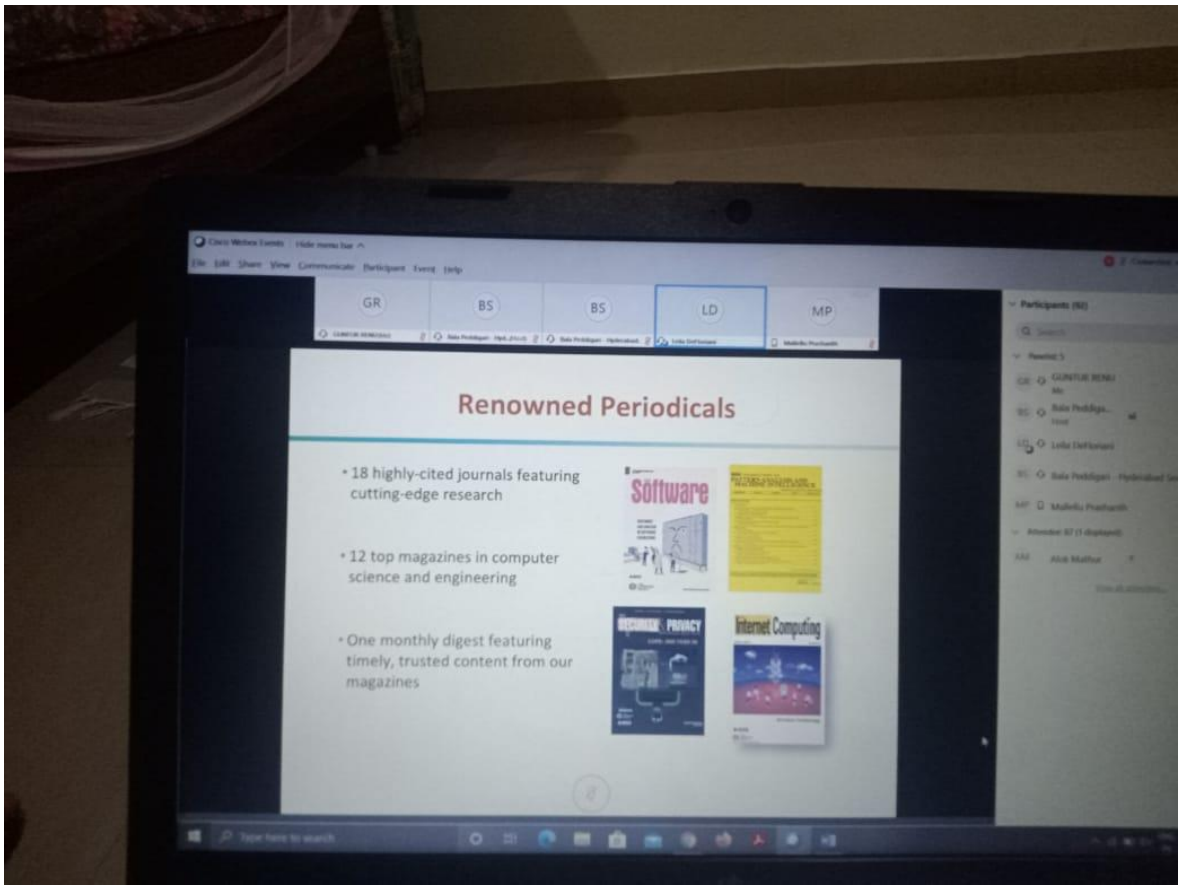


SOME MORE SNAPS FROM THE WEBINAR




GR
BS
BS
LD
MP
Our current applications
Large terrain modeling and analysis from LiDAR data
Multifield data analysis and visualization for atmospheric and oceanic data
Topo-bathymetric data analysis for marine navigation and geomorphometry
Canopy segmentation: massive-scale tree mapping and reconstruction from airborne and terrestrial LiDAR acquisitions
Vessel route and map reconstruction from GPS trajectories
Topology-based algorithms for social network analysis (migration networks)
Funding from NSF (National Science Foundation) and NOAA (National Oceanic and Atmospheric Administration)
Type here to search


Spatial data analysis and visualization
Our work
Geospatial data representation
focused on big unstructured static and time-varying field data
multiresolution representations for level-of-detail modelling, and modular data structures for meshes (2D, 3D and arbitrary dimensions) - compact, scalable, suitable for cloud computing
Topology-based data analysis
topology-based data clustering for data transformation for scalar fields and multifields
topology-based machine learning



On a whole that was a wonderful session.

THANK YOU,