



REMOTE SENSING: PRINCIPLES AND APPLICATIONS

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INTENDED AUDIENCE : Civil Engineering, Earth Science, Agriculture, Geoinformatics

COURSE OUTLINE :

Remote sensing (RS) is the technology that helps to gather information about objects and phenomena from a distance. There has been a radical transformation in the technology from the early application of 'image interpretation' to the paradigm of quantitative RS. The advancement in sensors and data processing algorithms have led to multiple applications of RS in various domains. To perform quantitative RS, one must understand the basic nature of RS sensors, the interaction between electromagnetic radiation and earth surface features and the assumptions and limitations of the algorithms applied. This course will enable the participants to learn about the necessary physical concepts involved in different phases of RS which will help in better appreciation of algorithms and existing datasets. The concepts will further be strengthened through explanation of selected applications.

ABOUT INSTRUCTOR :

Prof. Eswar is currently working as Assistant Professor in the Department of Civil Engineering, IIT Bombay. Previously he was working as Postdoctoral fellow in the NASA Jet Propulsion Laboratory, Pasadena, California from 2016-2018. Dr. Eswar completed his Bachelors in Geoinformatics from College of Engineering Guindy, Anna University, Chennai with University Gold Medal and Ph.D. from IISc, Bangalore. His primary research interests are thermal infrared remote sensing (TIR RS), mapping evapotranspiration and flux partitioning from RS, drought monitoring from RS datasets, spatial disaggregation of TIR data, applications of TIR RS in areas such as agriculture, water and urban studies. He had published articles in leading journals and is also a peer reviewer for some of the top journals in the field such as Remote Sensing of Environment, Remote Sensing etc.

COURSE PLAN :

Week 1: Introduction, electromagnetic radiation, basic laws

Week 2: Radiometry, Interaction of EMR with terrain features

Week 3: RS in visible and IR domain: Radiance to reflectance, atmospheric and topographic correction

Week 4: RS image acquisition, Different types of sensors, resolution concepts

Week 5: Resolution concepts, Spectral reflectance curves

Week 6: Spectral reflectance curves, Spectral indices

Week 7: Thermal infrared remote sensing

Week 8: Passive microwave radiometry

Week 9: Active microwave remote sensing: Imaging radar

Week 10: Platforms used for RS data acquisition and characteristics

Week 11: LIDAR, Common remote sensing datasets and data portals

Week 12: Applications of RS for land use and land cover monitoring, water resources management