

# Bharath Haridas Aithal

Assistant Professor @ Ranbir and Chitra Gupta School of Infrastructure design and Management



## Research Interests

Urban Pattern recognition, Land use modelling, Optical/IR/Hyperspectral remote sensing, Sensitivity and Uncertainty analysis, Environmental sustainability, Multi sensor fusion, Land surface temperature analysis in climate modelling, Urban floods, Coastal Floods, Machine learning in spatial analysis, UAV mapping

## Subjects taught @ IITKGP

DY17003	Do it Yourself (2020-2021)
ID69001	Infrastructure Sensing and Monitoring Laboratory (2020-)
ID69004	Infrastructure Design Laboratory (2021-)
ID61002	Remote Sensing GIS and Digital Image Processing (2017 -)
ID60017	Environmental and Natural resource Management for urban Infrastructure Planning (2017 -)
ID69001	Simulation Laboratory (2017-20)
ID69004	Virtual Reality laboratory (2017-20)
CE60140	Environmental Impact Assessment (2017-2018)

## Awards/Recognitions

- **June 2002:** Rajyapuraskar Scout(s)
- **Jun 2014:** ISRO STC IISC grant
- **Jun 2014:** IEEE GRSS travel grant.
- **Jul 2014:** DST International travel grant.
- **Nov 2014:** Sahyadri Young Ecologist award, Lake 2014
- **Oct 2015:** Best paper award, OSGIS 2015
- **Oct 2016:** Young scientist of the year, NESAI
- **December 2016:** Sahyadri Young Researcher award, Lake 2016
- **January 2017:** Best Paper Award, EcoUrbanism, IIT Kharagpur
- **November 2017:** Best Paper Award, Regional Science Congress
- **Feb 2018:** Best (2nd prize) Oral presented paper, BDCC, IIT Kharagpur
- **Feb 2019:** Best Paper award, CCIVA, IIT Kharagpur
- **March 2019:** Best Paper award, International Conference on Smart Cities, Jamia Milia Islamia
- **November 2019:** IEI Young Engineer Award
- **November 2019:** Indian National Geospatial Award 2019 by ISRS
- **July 2021:** Schlich Prize by Indian Forester
- **August 2022:** Faculty Excellence Award (AP) – IIT Kharagpur
- **August 2022:** Best Research Paper in Urban Transport, Sri Lanka Society of Transportation

## CONTACT


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## **Bachelor of Engineering (Electrical and Electronics)**

Bangalore University, India  
2005 - 2009

## Experience

2014 - 2015: Junior Research Associate, Indian Institute of Science, Bangalore, India.

2015 - 2016: Senior Research Associate, University of Southern California, USA & Indian Institute of Science, Bangalore, India.

2016 - till date: Assistant Professor, Indian Institute of Technology Kharagpur

## EDUCATION

**Ph. D.**

IISc, Bangalore 2009 - 2015

## Projects

- ✚ Spatial Decision Support System for Select Smart Cities in India Using Nature-Inspired Techniques funded by Science and Engineering Research Board (SERB), Govt. of India (2017-20)
- ✚ Scenario Based Projections of Future Land Use: A Spatially Explicit Knowledge Base for Climate Resilience, funded by ISIRD, SRIC, IIT Kharagpur (2017-21)
- ✚ Planning Smart Cities: Urban Dynamics and Surface Temperature Extraction Using Hyperspectral Remote Sensing Data funded by Department of Science and Technology (DST), Govt. of West Bengal (2018-21)
- ✚ Developing a Spatial Data Infrastructure with Application in Urban Transport, funded by NRDMS, Govt. of India (2019-22)
- ✚ Developing an Integrated Land Use-transport-emissions Model Utilizing Emerging Big Data Sources for Quantifying Energy and Environmental Impacts of Ridesharing Services, SPARC, Govt. of India (2019-22)
- ✚ Natural Capital Accounting and Valuation of Ecosystem Services- Karnataka State, India (2019-2022), United Nations Statistics Division (Joint PI) (PI: Dr. Ramachandra TV, IISc)
- ✚ Exploring Biofuel Prospects in West Coast of India (2019-2021), ISRO-IISc STC (Joint PI) (PI: Dr. Ramachandra TV, IISc)
- ✚ Consultancy Project: Study on young children and climate funded by ICLEI – Local Governments for Sustainability (2022)
- ✚ Centre of Excellence on Energy-Aware Urban Infrastructure, Under Intensification of Research in High Priority Areas (IRHPA). funded by DST, Govt. of India PI: Prof. Siddhartha Mukhopadhyay (2022-2027)

## Scientific Memberships

Institute of Electrical and Electronics Engineers (**IEEE**)- Senior Member (SMIEEE)  
Indian Society of Remote sensing- Life Member  
American geophysical union (**AGU**)  
The International Society of City and Regional Planners-(**ISOCARP**) – Individual member  
The Indian Science Congress Association (**ISCA**)- Life Member  
Indian Academy of Sciences  
Institution of Engineers (India) [**IEI**] -MIE  
Indian Society of Geomatics- Life member  
Indian Meteorological Society-Life Member  
The Institute of Doctors Engineers and Scientists – **IDES**  
International Association of Engineers –**IAENG**

## Services

Member, Council of Dean Student affairs (2023-Until date)  
Assistant warden- Homi J Bhabha hall of Residence, 2020-2023 (3 years)  
Assistant warden- Gokhale Hall of Residence, 2023-until date  
Departmental activity for Accounts- 2018- until date  
Departmental PGPEC member-2018- until date  
Representative for central library and departmental library in-charge-2018- until date  
Research scholar co-ordinator-2018- until date  
Departmental ERP representative: 2017-until date  
Placement and Training incharge: 2016-2020  
Incharge: Infrastructure Sensing and Monitoring UAV & computing laboratory: 2019-onwards, Funding 3.25 crores  
Incharge: Development of New Sensing, Monitoring lab:  
Incharge: School's Timetable preparation: 2017-2018

## Scientific Publications

Summary Published (Accepted)	Books	Journal Papers	Chapter(s)	Conference proceedings	Technical Reports
	03	67 (3)	15	117	43

## Book

- **Bharath, H.A.**, Ramachandra, T.V., 2016. Insights of urban dynamics for sustainable design of Smart Cities, Lap Lambert Academic Publishing, pp. 240
- **Bharath, H.A.**, Ramachandra, T.V., 2020. Urban Growth Patterns in India: Spatial Analysis for Sustainable Development. CRC Press, pp. 195
- **Bharath, H.A.**, Prakash PS, 2023 Building Feature Extraction with Machine Learning: Geospatial Applications. CRC Press, CRC Press, pp. 180.

## Journal(s)

1. **Bharath, H.A.**, Narendr, A., Sutapa, D., Developing assessment flow for Damage estimation of Mud housing typology through a case study against coastal floods, Scientific Reports, *Accepted*. (Impact factor: 4.99) **Nature**
2. Nimish, G., **Bharath, H.A.**, A Fine-scale Urban Land Surface Temperature Forecasting using Regression Analysis and Deep Learning Models. Environmental Management. *Accepted*. (Impact factor: 6.663) **Springer**
3. Madhumita, D., **Bharath, H.A.**, Devendra, P., Shivam, B., 2023. Road Segmentation: Exploiting the Efficiency Of Skip Connections For Efficient Semantic Segmentation. Journal of South Asian Logistics and Transport, 3, 58-73. <http://doi.org/10.4038/jsalt.v3i1.60>
4. Nimish, G., **Bharath, H.A.**, 2022. Effects of rising urban temperatures on the wellbeing of the residents – A case study of Kolkata Metropolitan Region. The International Review for Spatial Planning and Sustainable Development. 10(4), 28-39. I: [http://dx.doi.org/10.14246/irspds.10.4\\_79](http://dx.doi.org/10.14246/irspds.10.4_79) . **J-Stage**
5. Madhumita, D., **Bharath, H.A.**, 2022. Semantic Segmentation of High-Resolution Satellite images: a Deep Learning Approach. Journal of Geomatics, 16, 28-39. **ISG**
6. Prakash, P.S., **Bharath, H.A.**, 2022. Building footprint extraction from very high-resolution satellite images using Deep learning, Journal of Spatial Science, 1-17. <https://doi.org/10.1080/14498596.2022.2037473> (Impact factor: 1.981) **Taylor and Francis**
7. Ramachandra, T.V., Vinay, S., Asulabha, K.S., Sincy, V., Bharath, S., **Bharath, H.A.** 2022. Appraisal of Environmental Health and Ecohydrology of Free-Flowing Aghanashini River, Karnataka, India. Water, 14, 977. <https://doi.org/10.3390/w14060977> ((Impact factor: 3.530) **MDPI**
8. Prakash, P.S., **Bharath, H.A.**, 2021. Digital building height preparation from satellite stereo images, Photogrammetric Engineering & Remote Sensing, 87(8),557-566(10) <https://doi.org/10.14358/PERS.87.8.557> (Impact factor: 3.964) **ASPRS**
9. Aishwarya, N., Vinay, S., Bharath, H.A., Sutapa, D., 2021. Multi-dimensional parametric coastal flood risk assessment at a regional scale using GIS. Environment, Development and Sustainability <https://doi.org/10.1007/s10668-021-01839-6> (Impact factor: 4.080) **Springer**
10. Vinay, S., Aishwarya, N., **Bharath, H.A.** 2021. Forecasting and Evaluation of Impacts and Risk Due to Tidal Anomalies on a Coastal Island, Indian Journal of Remote Sensing, 50, 99-114. <https://doi.org/10.1007/s12524-021-01458-8> (Impact factor: 2.728) **Springer**
11. Chandan, M. C. **Bharath, H.A.** 2021. Impact assessment of Corridor Oriented development: A case of urban agglomerations of India, International review for spatial planning and sustainable development, 9, 172-194 [https://doi.org/10.14246/irspdc.9.2\\_172](https://doi.org/10.14246/irspdc.9.2_172) (Impact factor: 0.227) **J-STAGE**
12. Prakash, P.S., **Bharath, H.A.**, Satrupa, M., 2020. Automatic Extraction of Buildings from UAV based Imagery Using Artificial Neural Networks, Journal of the Indian Society of Remote Sensing. 49, 681–687. <https://doi.org/10.1007/s12524-020-01235-z> (Impact factor: 1.894) **Springer**

13. Ramachandra, T.V., Bharath, S., **Bharath, H.A.**, 2020. Insights of Forest Dynamics for the Regional Ecological Fragility Assessment. *Journal of the Indian Society of Remote Sensing*, 48, 1169–1189. <https://doi.org/10.1007/s12524-020-01146-z> (Impact factor: 1.894) **Springer**
14. **Bharath, H.A.**, Soumya, K.D., Prakash, P.S., 2020. Urban 3D structure reconstruction through a generative adversarial network model. *Arabian Journal of Science and Engineering*, 45, 10731–10741. <https://doi.org/10.1007/s13369-020-04850-7> (Impact factor: 2.807) **Springer**
15. **Bharath, H.A.**, Chandan, M.C., Vinay, S., Akshith, S., 2020. Land allocation model using Cellular Automata to understand housing demand and supply, *Spatial Information Research*, <https://doi.org/10.1007/s41324-020-00350-w> (Impact factor: 0.81) **Springer**
16. Sutapa, D., Tanaya, S., Aishwarya, N., **Bharath, H.A.**, 2020. Assessing human vulnerability to urban flood hazard using the Analytic Hierarchy Process and Geographic Information System. *International Journal of Disaster Risk Reduction*, 50, 101659. <https://doi.org/10.1016/j.ijdrr.2020.101659> (Impact factor :4.842) **Elsevier**
17. Aishwarya, N., Sutapa, D., Vinay, S., **Bharath, H.A.**, 2020. Adaptive Capacity Assessment for A Flood Vulnerable Region through Land Use Modelling and Socio Economic and Physical Indicators. *Journal of Environmental Informatics Letters* 3(2), pp. 107-119. <https://doi.org/10.3808/jeil.202000031> **Elsevier**
18. Prakash, P.S., **Bharath, H.A.** 2020. Retrieval of Building Roofs using High-Resolution Satellite Imagery through Machine Learning Approach, *Malaysian Journal of Remote Sensing & GIS*, 9(1), pp. 1-15
19. Nimish, G., **Bharath, H.A.**, Lalitha, A., 2020. Exploring temperature indices by deriving relationship between land surface temperature and urban landscape. *Remote Sensing Applications: Society and Environment*, <https://doi.org/10.1016/j.rsase.2020.100299> p.100299. (Impact factor :1.474) **Elsevier**
20. Ramachandra, T.V., Vinay, S., Bharath, S., Subhash Chandran, M.D., **Bharath, H.A.**, 2020. Insights into riverscape dynamics with the hydrological, ecological, and social dimensions for water sustenance, *Current Science*, 118(9), pp.1379-1389. (Impact factor :0.767)
21. Ramachandra, T.V., Jeffery M.S., **Bharath, H.A.**, Bharath, S., 2019. Micro level analyses of environmentally disastrous urbanisation in Bangalore, *Environmental Monitoring and Assessment*, 191(3), Pp 787 <https://doi.org/10.1007/s10661-019-7693-8> (Impact factor :3.420) **Springer**
22. Ramachandra, T.V., Jeffery M.S., **Bharath, H.A.**, Vinay, S., 2019. Geo-visualisation of landscape dynamics in the proposed mega industrial corridor, *Environmental Monitoring and Assessment*, 191(3), Pp 788 <https://doi.org/10.1007/s10661-019-7701-z> (Impact factor :3.420) **Springer**
23. Ramachandra, T.V., Rakhi, K.R., **Bharath, H.A.**, 2019. Valuation of Aghanashini Estuarine Ecosystem Goods and Services, *Journal of Biodiversity*, 10(2), Pp 45-58
24. Ramachandra, T.V., Sudharshan, B., Gouri, K., **Bharath, H. A.**, 2019. Assessment of Forest Dynamics in Chikkamagalur District, Central Western Ghats using Temporal Remote Sensing Data and Spatial Metrics, *Indian Forester*, 145(8), pp. 757-767. (Impact factor: 0.67)
25. **Bharath, H.A.**, Chandan, M.C., Nimish, G., 2019. Assessing land surface temperature and land use change through spatio-temporal analysis: a case study of select major cities of India, *Arabian Journal of GeoSciences*, 12:367. <https://doi.org/10.1007/s12517-019-4547-1> (Impact factor :1.985) **Springer**
26. Chandan, M.C., Nimish, G., **Bharath, H.A.**, 2019. Analysing Spatial Patterns and Trend of Future Urban Expansion Using SLEUTH, *Spatial Information Research*, 28(1), Pp 11-23. <https://doi.org/10.1007/s41324-019-00262-4> (Impact factor: 0.81) **Springer**
27. **Bharath, H.A.**, Chandan, M.C., Vinay, S., Ramachandra, T.V., 2018. Modelling urban dynamics in rapidly urbanising Indian cities, *The Egyptian Journal of Remote Sensing and Space Science*, 21(3), Pp. 201-210. <https://doi.org/10.1016/j.ejrs.2017.08.002> (Impact factor: 6.393) **Elsevier**
28. Sowmya, K.D., Prakash, P.S., **Bharath, H.A.** 2018. Automated Building Extraction using High-Resolution Satellite Imagery through Ensemble Modelling and Machine Learning, *Remote Sensing of Land*, 1(1) Pp. 1122-1136

29. Ramachandra, T.V., Jeffery M.S., **Bharath, H.A.**, Vinay, S., 2018. Modelling urban dynamics along two major industrial corridors in India, *Spatial Information Research*, 27, 37-48. pp. 10-28. <https://doi.org/10.1007/s41324-018-0217-8> (Impact factor: 0.81) **Springer**
30. **Bharath, H.A.**, Vinay, S., Ramachandra, T.V., 2018. Simulating urban growth by two state modelling and connected network. *Modelling Earth Systems and Environment*, 4(4), 1297-1308. <https://doi.org/10.1007/s40808-018-0506-1> **Springer**
31. Ramachandra, T. V., Sincy, V., Asulabha, K. S., Durga, M. M., Sudarshan, B., **Bharath, H. A.** 2018. Optimal Treatment of Domestic Wastewater through Constructed Wetlands, *Journal of Biodiversity*, 9(2), Pp. 81-102
32. Ramachandra, T.V., Gouri, K., Vishnu, B., **Bharath, H. A.**, Han, S.S., 2018. Municipal Solid Waste: Generation, Composition and GHG Emissions in Bangalore, India, *Renewable and Sustainable Energy Reviews*, 82(1), Pp. 1122-1136 <https://doi.org/10.1016/j.rser.2017.09.085> (Impact factor : 16.799) **Elsevier**
33. **Bharath, H.A.**, Chandan, M.C., Vinay, S., Gouri. H.A., Ramachandra, T.V., 2018. Green to gray: Silicon Valley of India, *Journal of Environmental Management*, 206, pp. 1286-1295. <https://doi.org/10.1016/j.jenvman.2017.06.072> (Impact factor: 8.910) **Elsevier**
34. Ramachandra, T.V., Gouri, K., Vishnu, B., **Bharath, H. A.**, Han, S.S., 2017. Green House Gas emissions with Mismanagement of Municipal Solid waste, *International Journal of Environment and Waste Management*, 20(4), Pp. 125-138
35. **Bharath, H.A.**, Chandan, M.C., Vinay, S., Ramachandra, T.V., 2017. Modelling the growth of two rapidly urbanizing Indian Cities, *Journal of Geomatics*, 11(2), Pp. 28-46 (Impact Factor: 1.249) **ISG**
36. **Bharath, H.A.**, Vinay, S., Ramachandra, T.V., 2017. Characterization and visualization of Spatial Patterns of Urbanisation and Sprawl through metrics and modelling, *Cities and the Environment (CATE)*, 10(1), pp. 1-10.
37. **Bharath, H.A.**, Chandan, M.C., Vinay, S., Ramachandra, T.V., 2017. Intra and Inter Spatio-Temporal Patterns of Urbanisation in Indian Megacities, *International Journal of Imaging and Robotics*, 17(2), pp. 28-39. (Impact factor: 0.86)
38. Ramachandra, T.V., **Bharath H. A.**, Gouri, K., Vinay, S., 2017. Green spaces in Bengaluru: Quantification through geospatial techniques, *Indian Forester*, 143(4), pp. 307-320. (Impact factor: 0.67)
39. Ramachandra, T.V., Vishnu, B., Gouri, K., **Bharath, H. A.**, Han, S.S., 2017. Economic disparity and CO2 emissions: The domestic energy sector in Greater Bangalore, India, *Renewable and Sustainable Energy Reviews*, 67, pp. 1331-1344. <https://doi.org/10.1016/j.rser.2016.09.038> (Impact factor: 16.799) **Elsevier**
40. Vinay, S., **Bharath, H.A.**, Subhash Chandran, M.D., Ramachandra, T.V., 2016. Linkages between Catchment Landscape Dynamics and the Natural Flow Regime, *International Journal of Earth Sciences and Engineering*, 9(3), pp. 244-251. (Impact Factor: 0.042)
41. Ramachandra, T.V., Vinay, S., **Bharath, H.A.**, 2016. Environmental Flow Assessment in a Lotic Ecosystem of Central Western Ghats, India. *Hydrol Current Res*, 7(248), p.2.
42. **Bharath, H.A.**, Ramachandra, T.V., 2016. Modelling Urban Dynamics of Bhopal, India. *Journal of Settlements and Spatial Planning*, 7(1), pp. 18-34.
43. **Bharath, H.A.**, Ramachandra, T.V., 2016. Bengaluru's reality: towards unliveable status with unplanned urban trajectory, **Current Science Editorial**, 110.
44. **Bharath, H.A.**, Ramachandra, T.V., 2016. Visualization of Urban Growth in Chennai: spatio-temporal using Geoinformatics, *Journal of the Indian Society of Remote Sensing*. 44(4), pp. 617-633, <https://doi.org/10.1007/s12524-015-0482-0> (Impact factor: 1.984) **Springer**
45. Ramachandra, T.V., **Bharath H. A.**, Shreejith, K., 2015a. GHG footprint of Major cities in India, *Renewable and Sustainable Energy Reviews*. 44, pp.473-495. <https://doi.org/10.1016/j.rser.2014.12.036> (Impact factor : 14.982) **Elsevier**
46. Ramachandra, T.V., **Bharath, H.A.**, Sowmyashree M. V., 2015b. Monitoring urbanization and its implications in a mega city from space: Spatiotemporal patterns and its indicators, *Journal of Environmental Management*. 148, pp.67-91. <https://doi.org/10.1016/j.jenvman.2014.02.015> (Impact factor: 8.910) **Elsevier**

47. Ramachandra, T.V., Bharath, H.A., Sowmyashree M. V., 2014. Urban Structure in Kolkata: Metrics and Modeling through Geo-informatics, *Applied Geomatics*, 6(4), 229-244. <https://doi.org/10.1007/s12518-014-0135-y> (Impact factor: 1.249) **Springer**
48. Ramachandra T.V., **Bharath, H.A.**, Barik, B., 2014. Urbanisation Pattern of Incipient Mega Region in India, *Tema. Journal of Land Use, Mobility and Environment*, 7(1), pp. 83-100.
49. Ramachandra, T.V., **Bharath, H. A.**, Sowmyashree, M. V., 2014. Urban Footprint of Mumbai - The Commercial Capital of India, *Journal of Urban and Regional Analysis*, Vol. 6(1), pp. 71-94.
50. Ramachandra, T.V., **Bharath, H. A.**, Sowmyashree, M. V., 2014. Monitoring spatial patterns of urban dynamics in Ahmedabad city, textile hub of India, *Spatium International Review*. Vol. 31, pp. 85-91. (Impact Factor :0.675)
51. Ramachandra, T.V., Bharath, S., **Bharath, H.A.**, 2013. Spatio-temporal dynamics along the terrain gradient of diverse landscape. *Journal of Environmental Engineering and Landscape Management*. 22 (1): 50-63. <https://doi.org/10.3846/16486897.2013.808639> (Impact Factor :1.732) **Taylor and Francis**
52. Ramachandra, T. V., **Bharath, H.A.**, Sowmyashree M. V. 2013. Analysis of spatial patterns of urbanisation using geoinformatics and spatial metrics, *Theoretical and empirical researches in urban management*. 8(4), 5-24. (Impact Factor :1.02)
53. Ramachandra, T. V., **Bharath, H.A.**, 2013. Urbanisation and Sprawl in the Tier II City: Metrics, Dynamics and Modelling Using Spatio-Temporal Data, *International Journal of Remote Sensing Applications*. 3(2), 66-73.
54. Ramachandra, T. V., **Bharath, H.A.**, Sowmyashree M. V. 2013. Analysis of spatial patterns of urbanisation using geoinformatics and spatial metrics, *Theoretical and empirical researches in urban management*. 8(4), 5-24. (Impact Factor :0.072)
55. Ramachandra, T.V., **Bharath, H.A.**, Sannadurgappa, D., 2012. Insights to Urban Dynamics through Landscape Spatial Pattern Analysis, *Journal of Applied Earth Observation and Geoinformation*. 18, 329-343. <https://doi.org/10.1016/j.jag.2012.03.005> (Impact Factor: 7672) **Elsevier**
56. Bharath, S., **Bharath, H.A.**, Ramachandra, T.V., 2012. Peri-Urban to Urban Landscape Patterns Elucidation through Spatial Metrics, *International Journal of Engineering Research and Development*, 2(12), 58-81.
57. Ramachandra, T.V., **Bharath, H.A.**, 2012. Spatio-Temporal Pattern of Landscape Dynamics in Shimoga, Tier II City, Karnataka State, India, *International Journal of Emerging Technology and Advanced Engineering*, 2(9), 563-576.
58. Ramachandra, T.V., **Bharath, H.A.**, 2012. Spatio temporal patterns of urban growth in Bellary, Tier II City of Karnataka State, India, *International Journal of Emerging Technologies in Computational and Applied Sciences*, 3(2), 201-212.
59. Ramachandra, T.V., **Bharath, H.A.**, 2012. Understanding urban sprawl dynamics of Gulbarga - Tier II city in Karnataka through spatio-temporal data and spatial metrics, *International Journal of Geomatics and Geosciences*, 3(2), 373-388.
60. Vishnu, B., **Bharath, H.A.**, Kumar, U., Bharath, S., Ramachandra, T.V., 2012. Exposition of Urban Structure and Dynamics through gradient Landscape metrics for sustainable management of Greater Bangalore, *Journal of FIIB review*, 1(1): 53-66.
61. Ramachandra, T.V., **Bharath, H.A.**, Sreekantha, S., 2012. Spatial Metrics based Landscape Structure and Dynamics Assessment for an emerging Indian Megalopolis, *International Journal of Advanced Research in Artificial Intelligence*, 1(1), 48-57.
62. Ramachandra, T.V., **Bharath, H.A.**, 2012. Land use dynamics with the implementation of large scale thermal power, *International Journal of Earth Sciences and Engineering*, 5(3), 409-417. (Impact Factor: 0.042)
63. Ramachandra, T.V. **Bharath, H.A.**, 2012. Spatio-Temporal Dynamics of Urbanising Landscape in Twin Cities in Karnataka, India, *International Journal of Artificial Intelligence and Mechatronics*, 1(5), 87-98.

64. **Bharath, H.A.,** Ramachandra, T.V. Sannadurgappa. D, 2012. Land Surface Temperature Analysis in an Urbanising Landscape through Multi-Resolution data, Research & Reviews: Journal of Space Science & Technology, 1(1), 1-10
65. Subash Chandran M D, Rao G R, Prakash Mesta, **Bharath, H.A.,** Kumar, U., Ramachandra, T V., 2011. Landslides in coastal Uttara Kannada: Management towards risk reduction, Journal Applied Disaster Research, 1(1), 7-17.
66. Ramachandra, T. V., **Bharath, H.A.,** Kumar, U., Joshi, N. V., 2013. Prediction of Shallow landslide prone regions in undulating terrain. Disaster Advances. 6(1), 53-63. (Impact Factor: 2.27)
67. Ramachandra, T. V., **Bharath, H.A.,** Vinay S., 2013. Land Use Land Cover Dynamics in a Rapidly Urbanising Landscape, SCIT Journal. 13, 1-14

## Chapter in a book

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1. Aishwarya, N., **Bharath, H.A.** 2023. Assessing coastal flood impact on buildings: A climate change perspective from the developing nation. In: Geohazards and Disaster Risk Reduction: Multidisciplinary and Integrated Approaches, Springer. ISBN 978-3-031-24540-4
2. Vinay, S., **Bharath, H.A.** 2023. Geo-spatial modelling of flood risk due to local sea-level rise and landscape dynamics: A case of Sagar Island. In: Applications of Remote Sensing and GIS in Natural Resources and Built Infrastructure Management, Springer. 978-3-031-14095-2
3. Nimish, G., **Bharath, H.A.,** 2023. Land Surface Temperature responses to urban landscape dynamics. In: Handbook of Himalayan Ecosystems and Sustainability: Spatio-Temporal Monitoring of Water Resources and Climate, Volume 2, CRC Press. ISBN 978-1-032-20315-7
4. Nimish, G., **Bharath, H.A.,** Ramachandra, T.V., 2022. Visualisation of Land use Change Pattern and Its Impact on Urban Heat Islands. In: Global Urban Heat Island Mitigation, Elsevier. ISBN 9780323897945
5. Chandan, M.C., Nimish, G., **Bharath, H.A.** 2021. Analysing and predicting urban expansion and its effects on surface temperature for two Indian megacities: Bengaluru and Chennai. In: Geo-Spatial Technology and Smart City Development, Springer. ISBN 978-3-030-71944-9
6. Prakash, P. S., Nimish, G., Chandan, M.C., **Bharath, H.A.** 2021. Urbanization: pattern, effects and modelling. In: Machine Learning for Urban Computing, Springer. ISBN 978-981-16-0934-3
7. Chandan, M.C., **Bharath, H.A.** 2020. Visualising future trends of Urban Expansion Through Spatio-Temporal Metrics and land use modelling. In Future Cities, Springer. ISBN 978- 81-927014-5-5.
8. Nimish, G., Sudeep, V.B., **Bharath, H.A.,** 2020. Impacts of Urban Land Use Land Cover Pattern on Land Surface Temperature. In: Smart Cities—Opportunities and Challenges, Springer. ISBN 978-981-15-2544-5
9. **Bharath, H.A.,** Nimish, G., Chandan, M.C., 2020. Exposition of spatial urban growth pattern using PSO-SLEUTH and identifying its effects on surface temperature. In: Urban Ecology, Elsevier. ISBN: 9780128207307
10. Ramachandra, T.V., **Bharath, H.A.** Vinay, S., Chandan, M.C., 2020. Simulation and modelling the urban dynamics in Bangalore - Silicon Valley of India. In: Planning Megacities in the Global South, Roultege. ISBN: 9780367223724
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109. **Bharath, H.A.**, Ramachandra, T.V., 2013. Measuring urban sprawl in Tier II cities of Karnataka, India, In Proceedings IEEE Global Humanitarian Technology Conference: South Asia Satellite (IEEE-GHTC-SAS), 2013, Techno Park, Trivandrum, Kerala, India, 23-24 Aug., 2013.
110. **Bharath, H.A.**, Vinay S., Ramachandra, T.V., 2013. Comprehension of temporal land use dynamics in urbanising landscape, In Proceedings of 2<sup>nd</sup> National Remote Sensing Users Meet, NRSC, Hyderabad, India, 20-21 February, 2013.
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113. **Bharath, H.A.**, Sannadurgappa, D., Ramachandra, T.V., 2012, Simulation of Urban dynamics through Spatial Metrics, Proceedings of Student Symposium, Centre for Sustainable Technologies, IISc, Bangalore, India, 18 May, 2012.
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116. **Bharath, H.A.**, Sannadurgappa, D. Ramachandra, T.V., 2012. Status of wetlands in urbanising Tier II cities of Karnataka, In online proceedings Lake 2012: Wetlands, National Conference on Conservation and Management of Wetland Ecosystems, 06-08, Nov 2012, School of Environmental Sciences, M. G. University, Kerala, India.
117. Vinay S, **Bharath, H.A.**, and Ramachandra, T.V., 2012. Spatio Temporal dynamics of Raichur City, In proceedings Lake 2012: National Conference on Conservation and Management of Wetland Ecosystems, 06-08, Nov 2012, School of Environmental Sciences, M. G. University, Kerala, India.
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119. **Bharath, H.A.**, Bharath, S., Sannadurgappa, D., Ramachandra, T. V., 2012, Effectiveness of landscape Spatial Metrics with reference to the Spatial Resolutions of Remote Sensing Data, Proceedings of India Conference on Geo-spatial Technologies & Applications 2012, IIT Bombay, Mumbai, India, 12-14 April, 2012.
120. Subash Chandran, M. D., Rao, G. R., Prakash Mesta, **Bharath, H.A.**, Kumar, U., Ramachandra, T. V., 2011. Landslides in coastal Uttara Kannada: Management towards risk reduction. Disaster, Risk Vulnerability Conference 2011, School of Environmental Sciences, Mahatma Gandhi University, India. March 12- 14, 2011, pp. 7-22.
121. Ramachandra, T. V., **Bharath, H.A.**, Vinay, S., Kumar, U., Joshi, N. V., Venugopal Rao. 2013. Modelling Urbanisation pattern. In proceedings of the 30<sup>th</sup> Annual In-House Symposium on Space Science and Technology, ISRO-IISc Space Technology Cell, Indian Institute of Science, Bangalore, India, 7-8 November, 2010.
122. **Bharath, H. A.**, Sannadurgappa, D., Ramachandra, T.V., 2010. Urban growth monitoring through spatio-temporal analysis, in online proceedings Lake 2010: Wetlands, Biodiversity and Climate change, 22-24 Dec 2011, Satish Dhawan Auditorium, Indian Institute of Science, Bangalore.
123. Ramachandra T. V., Kumar, U., **Bharath H. A.**, Diwakar P. G., Joshi, N. V., 2009. Landslide Susceptible Locations in Western Ghats: Prediction through open Modeller, In proceedings of the 26<sup>th</sup> Annual In-House Symposium on Space Science and Technology, ISRO-IISc Space Technology Cell, Indian Institute of Science, Bangalore, India, 28-29 January, 2010.
124. **Bharath, H. A.**, Kumar, U., Ramachandra T. V., 2009. Fusion of multi resolution remote sensing data for urban sprawl analysis, Proceedings of COSMAR 2009, Department of Management Studies, Indian Institute of Science, Bangalore, India, 5-6 November, 2009.

# Technical Reports

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1. Ramachandra, T. V., Bharath, S., Vinay, S., **Bharath, H. A.**, 2021. Ecosystem extent account for Karnataka state. UNEP Technical Report, Environmental Information System, CES, Indian Institute of Science, Bangalore
2. Ramachandra, T. V., Bharath, S., Vinay, S., Rakesh, D.R., **Bharath, H. A.**, 2021. Ecosystem condition account for Karnataka state. UNEP Technical Report, Environmental Information System, CES, Indian Institute of Science, Bangalore
3. Ramachandra, T. V., Bharath, S., Vinay, S., **Bharath, H. A.**, 2021. Valuation of Ecosystem services. UNEP Technical Report, Environmental Information System, CES, Indian Institute of Science, Bangalore
4. Ramachandra, T. V., Bharath, S., Vinay, S., Chandan, M.C., **Bharath, H. A.**, 2021. Scenario based assesment of policy interventions in Karnataka state. UNEP Technical Report, Environmental Information System, CES, Indian Institute of Science, Bangalore
5. Ramachandra, T. V., Bharath S., Vinay, S., Asulabha, K. S., Sincy, V., **Bharath, H. A.**, 2020. National Environmental Survey (NES)-Select Districts of India. ENVIS Technical Report 163, Environmental Information System, CES, Indian Institute of Science, Bangalore
6. Ramachandra, T. V., Bharath S., Sneha, H., Chandran, M.D.S., **Bharath H. A.**, 2019. Profile of Rivers in Karnataka, ENVIS Technical Report 145, Sahyadri Conservation Series 81, Energy & Wetlands Research Group, CES, Indian Institute of Science, Bangalore
7. **Bharath, H.A.**, Arkopal, K.G., Bhargab, M., Ankhi, B., Swati, M., Soumya, K.G., Uday, S., 2018. Roadmap to Develop Urban Observatory in India. Draft report to British Deputy High commission, Kolkata, India
8. Uday, S., Bhargab, M., Arkopal, K.G., **Bharath, H.A.**, Ankhi, B., Swati, M., Soumya, K.G., 2018. Legal and Policy Perspectives of Developing Urban Observatory in India. Draft report to British Deputy High commission, Kolkata, India
9. Ramachandra, T. V., Jeffery, M.S., **Bharath, H. A.**, Uttam, K., Vinay, S., Brigit M.B., 2018. Spatial patterns of land use dynamics in Mumbai Pune express corridor. ENVIS Technical Report 137, Environmental Information System, CES, Indian Institute of Science, Bangalore
10. Ramachandra, T. V., Jeffery, M.S., **Bharath, H. A.**, Uttam, K., Vinay, S., Revathi N., 2018. Urban dynamics in proposed Mangalore Bangalore Chennai Industrial corridor. ENVIS Technical Report 115, Environmental Information System, CES, Indian Institute of Science, Bangalore
11. Ramachandra, T. V., Vinay, S., Sudarshan, B., Bharath S., **Bharath, H. A.**, 2017. Unbated Violations in Agara-Bellandur wetlands. ENVIS Technical Report 134, Environmental Information System, CES, Indian Institute of Science, Bangalore
12. Ramachandra, T. V., Vinay, S., **Bharath, H. A.**, 2017. Koramangala Floods: Causes, Mismanagement of Landscape: Abuse of Bellandur-Agara wetlands, Narrowing and Concretising RajaKaluve and encroachment of storm water drains, Dumping of solid waste & building debris, Apathy of Civic Agencies. ENVIS Technical Report 131, Environmental Information System, CES, Indian Institute of Science, Bangalore
13. Ramachandra, T. V., Vinay, S., Bhargavi, R., **Bharath, H. A.**, 2017. Integrated watershed management for water & food security in Kolar and Chikballapur districts, Karnataka. ENVIS Technical Report 133, Environmental Information System, CES, Indian Institute of Science, Bangalore
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15. Ramachandra, T. V., Vinay, S., Asulabha, K. S., Sincy, V., Sudarshan, B., Durga, M. M., **Bharath, H. A.**, 2017. Rejuvenation Blueprint for Lakes in Vrishabhavathi Valley (V. Valley). ENVIS Technical Report 122, Environmental Information System, CES, Indian Institute of Science, Bangalore
16. Ramachandra, T. V., Vinay, S., **Bharath H. A.**, 2017. Frequent Floods in Bangalore: Causes and Remedial Measures, ENVIS Technical Report 123, Environmental Information System, CES, Indian Institute of Science, Bangalore

17. Ramachandra, T. V., Durga M., M., Vinay, S., Sincy, V., Asulabha, K.S., Sudharshan, B., **Bharath, H.A.**, 2017. Bellandur and Varthur Lake rejuvenation blueprint. ETR 116, Energy & Wetlands Research Group, Centre for Ecological Sciences, Indian Institute of Science, Bangalore
18. Ramachandra, T. V., Vinay, S., Durga M., M., Sincy, V., **Bharath, H.A.**, 2016. Water situation in Bengaluru, ETR 114, Energy & Wetlands Research Group, Centre for Ecological Sciences, Indian Institute of Science, Bangalore
19. Ramachandra, T. V., Subhash chandran, M.D., Bharath, S., Gouri, K., **Bharath, H.A.**, et al., 2016. My Village Biodiversity: Documentation of Western Ghats Biodiversity through Network of Students and Teachers, ETR 113, Sahyadri Conservation Series 61, Energy & Wetlands Research Group, Centre for Ecological Sciences, Indian Institute of Science, Bangalore
20. Ramachandra, T. V., Gouri, K., **Bharath, H.A.**, Bharath, S., Vinay, S., Harish, B., 2016. Mini forest at Indian Institute of Science: The Success Model for Rejuvenating Ecology and Hydrology in Rapidly Urbanizing Landscapes, ETR 110, Sahyadri Conservation Series 58, Energy & Wetlands Research Group, Centre for Ecological Sciences, Indian Institute of Science, Bangalore
21. Ramachandra, T. V., Vinay, S., Sincy, V., Asulabha, K. S., Sudarshan, P. B., and **Bharath H. A.**, 2016. Devarabisanahalli Lake: Path towards Ecological restoration, ENVIS Technical Report 104, Energy & Wetlands Research Group, Centre for Ecological Sciences, Indian Institute of Science, Bangalore
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24. Ramachandra, T. V., Asulabha, Sincy, V., Vinay, S., **Bharath, H. A.**, 2015. Sankey lake: waiting for an immediate sensible action, Pathetic status of wetlands in Bangalore: epitome of inefficient and Uncoordinated governance. ENVIS Technical Report No. 74, Centre for Ecological Sciences, Indian Institute of Science, Bangalore
25. Ramachandra, T. V., Asulabha, Sincy, V., **Bharath, H. A.**, Vinay, S., Durga M., M., 2015. Varthur Fiasco: Pathetic status of wetlands in Bangalore: epitome of inefficient and Uncoordinated governance. ENVIS Technical Report No. 93, Centre for Ecological Sciences, Indian Institute of Science, Bangalore
26. Ramachandra, T.V., Shreejith, K., Bharath, H. A., 2014. Wetlands: The Kidneys of Bangalore's Landscape In: wetlands newsletter. Environmental law institute, Pp. 12-16.
27. Ramachandra, T.V., Harish, R.B., **Bharath, H. A.**, Rao, G. R., Sudarshan, P.B., Vinay, S., Ganesh, H., Gouri, K., Vishnu, D. M., 2015., Biodiversity, ecology, energy, landscape dynamics & hydrology of Agastya foundation campus, Kuppam, ENVIS Technical Report No. 89, Centre for Ecological Sciences, Indian Institute of Science, Bangalore
28. Ramachandra, T. V., Vinay, S., **Bharath, H. A.**, 2015. Environmental Flow Assessment in Yettinahole, ENVIS Technical Report No. 91, Centre for Ecological Sciences, Indian Institute of Science, Bangalore
29. Ramachandra, T. V., **Bharath, H. A.**, Vinay, S., Bharath, S., Asulabha, K. S., Sincy, V., Sudarshan, P. B., 2015. Vanishing Lakes Interconnectivity & Violations in Valley Zone: Lack of Co-ordination among Para-State Agencies, ENVIS Technical Report No. 85, Centre for Ecological Sciences, Indian Institute of Science, Bangalore
30. Ramachandra, T. V., Vinay, S., **Bharath, H. A.**, 2015. Detrimental landuse changes in Agara-Bellandur wetland, ENVIS Technical Report No. 95, Centre for Ecological Sciences, Indian Institute of Science, Bangalore
31. Ramachandra, T. V., Subash Chandran, M.D, Vinay, S., **Bharath, H.A.**, 2014, Water Scarcity in Varada Catchment: Need to arrest Deforestation on Priority, ENVIS Technical Report No. 82, Environmental Information System (ENVIS), Centre for Ecological Sciences, Indian Institute of Science, Bangalore
32. Ramachandra, T. V., Subash Chandran, M.D, Joshi N.V., Vinay, S., **Bharath, H.A.**, Gouri, K., 2014, Waterbodies of Uttara Kannada, ENVIS Technical Report No. 81, Environmental Information System (ENVIS), Centre for Ecological Sciences, Indian Institute of Science, Bangalore
33. Ramachandra, T. V., **Bharath, H.A.**, Vinay, S., Gouri, K., Nupur N., 2014, Trees of Bangalore, ENVIS Technical Report No. 75, Environmental Information System (ENVIS), Centre for Ecological Sciences, Indian Institute of Science, Bangalore



34. Ramachandra, T.V., Durga Madhab M., Sudarshan P. B., Asulabha, K.S., Sincy, V., **Bharath, H. A.**, 2014. Integrated Wetlands Ecosystem: Sustainable Model to Mitigate Water Crisis in Bangalore, ENVIS Technical Report 76, Environmental Information System (ENVIS), Centre for Ecological Sciences, Indian Institute of Science, Bangalore.
35. Ramachandra, T. V., Asulabha, K. S., **Bharath H. A.**, Bharath, S., Durga Madhab M., et al., 2014, Environment monitoring in the neighborhood, ENVIS Technical Report No. 77. Environmental Information System (ENVIS), Centre for Ecological Sciences, Indian Institute of Science, Bangalore
36. Ramachandra, T. V., **Bharath, H.A.**, Vinay, S., Aamir Amin I., 2013, Conservation of Bellandur wetlands: Obligation of decision makers to ensure Intergenerational equity, ENVIS Technical Report No. 55, Environmental Information System (ENVIS), Centre for Ecological Sciences, Indian Institute of Science, Bangalore
37. Ramachandra, T. V., Subash Chandran, M.D, Joshi, N.V., Vinay S., **Bharath, H.A.**, Bharath, S., 2013. Carrying capacity of river basins considering ecological and social demands, ENVIS Technical Report No. 66. Environmental Information System (ENVIS), Centre for Ecological Sciences, Indian Institute of Science, Bangalore
38. Ramachandra, T. V., **Bharath, H.A.**, 2013. Urban sprawl in tier-ii cities of Karnataka: Analysis of patterns, process and environmental sustainability, CiSTUP Technical report: CIST033, pp 76, Centre for *infrastructure*, Sustainable Transportation and Urban Planning (CiSTUP), Indian Institute of Science, Bangalore
39. Ramachandra, T.V., Subash Chandran, M.D., Sudarshan P. B., **Bharath, H.A.**, Rao G.R., Vishnu M., 2013. Status of Forest in Shimoga District, Karnataka. Sahyadri Conservation Series 23, ENVIS Technical Report: 53. Environmental Information System (ENVIS), Centre for Ecological Sciences, Indian Institute of Science, Bangalore
40. **Bharath H. A.**, Ramachandra, T. V., 2012, Modelling the Spatial Patterns of Landscape dynamics: Review. Centre for Ecological Science, Indian Institute of Science, Bangalore. CES Technical Report No. 127, Centre for Ecological Sciences, Indian Institute of Science, Bangalore
41. Ramachandra, T. V., Ramakrishna Y. B., Gautham Krishnadas, Sudarshan P. B., Durga Madhab M., **Bharath H. A.**, 2012, Environmental profile and people's livelihood aspects in the vicinity of coal based thermal power plant at Yellur panchayat, Udupi district, CES Technical Report No. 126. Centre for Ecological Sciences, Indian Institute of Science, Bangalore
42. Ramachandra, T.V., Subash Chandran, M.D, Joshi N.V., Pallav Julka, Kumar, U., **Bharath, H.A.**, Prakash Mesta, Rao, G.R., Vishnu Mukri, 2012. Sahyadri Conservation Series 7, ENVIS Technical Report No. 28, Environmental Information System (ENVIS), Centre for Ecological Sciences, Indian Institute of Science, Bangalore
43. Ramachandra T. V., Subhash Chandran, M.D., Ananth A., Rao, G.R, Bharath S, **Bharath, H.A.**, 2012, Tragedy of the KAN sacred forests of Shimoga district: Need for urgent policy interventions for conservations, CES Technical Report No. 128. Centre for Ecological Sciences, Indian Institute of Science, Bangalore

## Keynote address & Sessions Chaired in Conferences

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### 1. Ramaiah Institute

2. **“Development Model Simulation and Visualisation – A process of developing a Decision Support System”**, on 30 Dec 2020, at Lake 2020, Indian Institute of Science, Bangalore, India
3. **“Modelling and development of Urban corridors in India”**, on 10<sup>th</sup> May 2017, at APN Indo China workshop, Chongqing, China
4. **“Vision towards development of an Urban observatory - IIT Kharagpur”**, Keynote address, on 29<sup>th</sup> December 2016, at Lake 2016. Alva’s College, Moodabidri, Karnataka, India
5. **“Technology and Nature” - insight into urban world using Space Technologies**, Keynote address, on 16<sup>th</sup> April 2015, at 2<sup>nd</sup> National Conference on Recent Advances in Computer Sciences (NCRACS-2015). Sri Krishna College of Engineering and Technology, Coimbatore, India.
6. **“Modelling and Geo-visualisation of Urban Growth”**, Keynote address, on 15<sup>th</sup> November 2014, AT Lake 2014. Sirsi, Karnataka, India.
7. **Theme 2: Research advances in computer technology**, Venue - 2<sup>nd</sup> National Conference on Recent Advances in Computer Sciences (NCRACS-2015). Sri Krishna College of Engineering and Technology, Coimbatore, India.
8. **Theme: Urban Dynamics**, Venue – Lake 2014, Conference on Conservation and Sustainable Management of Wetland Ecosystems in Western Ghats Sciences. Parisara Auditorium, Swarnavalli, Sirsi, Uttara Kannada, Karnataka, India.
9. **Theme 13: Open-source GIS, applications of Geo informatics in conservation and management,”** Venue – CiSTUP Seminar Hall, 23 December 2010 in Lake 2010: Wetlands, Biodiversity and Climate Change, 22-24 December, 2010, Satish Dhawan Auditorium, Indian Institute of Science, Bangalore.

## INVITED / GUEST LECTURES

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- **“Fusion of multi resolution data for urban sprawl analysis”**, at Open Source GIS in India, Discussion Meeting, Centre for Infrastructure, Sustainable Transport and Urban Planning, Indian Institute of Science, Bangalore, India, November 16, 2009.
- **“Urbanization and Sprawl”** at Student’s Symposium, Centre for Sustainable Technologies, Indian Institute of Science, Bangalore, India, November 24, 2010.
- **“Geospatial Data Analysis: Techniques and Tools for Resource Management”** at IISc-Microsoft Workshop, KSCST (Karnataka State Council for Science and Technology) Seminar Hall, Indian Institute of Science campus, Bangalore, India, February 9, 2009.
- **“Understanding urban dynamics through Landscape indices,”** In CES In-house symposium, 02-03, Nov 12, New Biological Science Auditorium, Indian Institute of Science, Bangalore.
- **“Environment modeling and simulation through FOSS”**, in session: Environmental Simulation and Modeling at NCAR 2010, Hyderabad India.
- Lectures on Digital Image pre-processing, Satellite data, Remote sensing in **“Remote sensing & GIS”** at Centre for Continuing Education, Indian Institute of Science, Bangalore, India during September 17-21, 2010.
- Lectures on Environmental Impact assessment and EIA documentation and process in **“Environmental Management”** in Internet Based Distance Education Courses at Centre for Continuing Education, Indian Institute of Science, Bangalore, India during Dec 23-28, 2010.
- Lectures on Environmental Management System standards, Environmental Management techniques in **“Environmental Management”** in Internet Based Distance Education Courses at Centre for Continuing Education, Indian Institute of Science, Bangalore, India during Dec 23-28, 2011.
- Lectures on Introduction to Grass, Introduction to Image fusion in **“Free and open source software”** in FOSS4G at Centre for Infrastructure, Transportation and Urban planning, Indian Institute of Science, Bangalore, India during May 1-5, 2011.
- Lectures on Life cycle assessment, Environmental Management System standards in **“Environmental Management”** Internet Based Distance Education Courses at Centre for Continuing Education, Indian Institute of Science, Bangalore, India during AUG-DEC, 2012

- Lecture on “Urbanisation, Urban sprawl quantification” at JAYAM college of engineering, Dharmapuri, Tamilnadu. During June 26th – 28th, 2012.
- Lecture on “A Bird eye view into remote sensing, image processing and using GRASS”, in KSCA, Bangalore, Nov 3rd 2012.
- Lectures on Life cycle assessment, Environmental Management System standards in “Environmental Management” Internet Based Distance Education Courses at Centre for Continuing Education, Indian Institute of Science, Bangalore, India during AUG-DEC, 2013.
- Lecture on “Introduction and applications of Remote sensing and Image processing” at Civil Department, Karunya University, Coimbatore, India, January 10-13th, 2013
- Lectures on Introduction to Remote sensing “A series of lectures on free and open source software (GRASS, QGIS),” workshop on “Using Free and Open Source Geospatial (FOSS4G) Tools” on 28<sup>th</sup> Feb. 2014. 24<sup>th</sup> - 28<sup>th</sup> Feb, 2014, Indian Institute of Science, Bangalore, India
- Lectures on “Understanding and reading maps” workshop on “Using Free and Open Source Geospatial (FOSS4G) Tools” on 25<sup>th</sup> Feb. 2014. 24<sup>th</sup> - 28<sup>th</sup> Feb, 2014, Indian Institute of Science, Bangalore, India
- Lectures on “Digital Images, Processing and application” workshop on “Using Free and Open Source Geospatial (FOSS4G) Tools” on 27<sup>th</sup> Feb. 2014. 24<sup>th</sup> - 28<sup>th</sup> Feb, 2014, Indian Institute of Science, Bangalore, India
- Lectures on “Mapping of Earth Features” workshop on “Water & Environment - Interactive Session with School Teachers” on 15<sup>th</sup> Feb. 2014. New Bioscience building, Indian Institute of Science, Bangalore, India
- Lecture on "Urban revolution and GHG footprint in India", in workshop on “Urban Environmental Issues”, organized by CiSTUP, Indian Institute of Science, Bangalore. Feb. 27-28, 2015.
- Lectures on Life cycle assessment, Environmental design in “Environmental Management” Internet Based Distance Education Courses at Centre for Continuing Education, Indian Institute of Science, Bangalore, India during AUG-DEC, 2015.
- Lecture on “Smart cities and Unplanned urbanization”, at civil engineering, IIT-Kanpur, invited guest lecture, 23<sup>rd</sup> November 2015.
- Lecture on “Smart cities – Urbanisation, consequence and Mitigation”, at Ranbir and chitra Gupta school of infrastructure design and Management, IIT-Kharagpur, invited lecture, 21<sup>st</sup> December 2015.
- UK-India Joint Network on Sustainable Cities and Urbanization in India, on Urban Observatories for Enhancing the Quality of Urban Life in India, September 2016.
- Lectures on “Urban Transformation and Environmental Impact”, at Indian Institute of Science, Bangalore, Invited guest lecture in Environmental Management 2019, December 2019
- Lectures on “Geographic Information System and Mapping”, at Indian Institute of Science, Bangalore, Invited Lecture in Green Skill Development Program by Ministry of Environment and Forest Under ENVIS program, January 2020.
- Lectures on Environmental Management System standards, Environmental Management techniques in “Environmental Management” in Internet Based Distance Education Courses at Centre for Continuing Education, Indian Institute of Science, Bangalore, India during August and December 15-20. 2021.
- Lectures on Environmental Management System standards, Life Cycle Assesment in “Environmental Management” in Internet Based Distance Education Courses at Centre for Continuing Education, Indian Institute of Science, Bangalore, India during August 15-20. 2022.
- Lecture on “Coastal Flood Resilience through Geoinformatics” at University of Allahabad, Prayagraj, Uttar Pradesh, India. Lecture in three days workshop on Satellite Earth Observation and Artificial Intelligence Role in Development of Disaster Resilient Infrastructure (EOAIDRI), November 2022.

## Courses conducted

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- Technical resource faculty for GSDP 2019-20: Green Skill Development Programme: Valuation Of Ecosystem Goods And Services, Feb 25 –Mar 10, 2020, Indian Institute of Science, Bangalore, India
- Technical resource faculty for GSDP 2019-20: Green Skill Development Programme: Valuation Of Ecosystem Goods And Services, Jan 01 –Jan 15, 2020, Indian Institute of Science, Bangalore, India
- GIAN course on “Smart Urban Multimodal Transport Planning, Operations and Management” with Prof. Brian Park University of Virginia, USA. July 08 – July 12 2019, IIT Kharagpur, India
- Technical resource faculty for AICTE workshop on “Using Free and Open Source Geospatial (FOSS4G) Tools”. 28<sup>th</sup> – 31<sup>st</sup> May, 2019, Indian Institute of Science, Bangalore, India
- Technical resource faculty for TEQUIP workshop on “Using Free and Open Source Geospatial (FOSS4G) Tools”. 28<sup>th</sup> – 31<sup>st</sup> May, 2018, Indian Institute of Science, Bangalore, India
- AICTE workshop on “Using Free and Open Source Geospatial (FOSS4G) Tools in Urban management”. 28<sup>th</sup> Feb– 03<sup>rd</sup> March, 2019, Indian Institute of Technology Kharagpur, India
- GIAN course on “Land Cover Land Use change and its Impacts on Climate” with Prof. Atul Jain, University of Illinois, USA. Oct 29<sup>th</sup> – Nov 2<sup>nd</sup> 2018, IIT Kharagpur, India
- Technical resource faculty for workshop on “Using Free and Open Source Geospatial (FOSS4G) Tools”. 24<sup>th</sup> - 28<sup>th</sup> Feb, 2014, Indian Institute of Science, Bangalore, India
- “Geoinformatics: An introduction” at IIITM-K, Interaction with M.Tech Students, Trivandrum, Kerala, Aug 23<sup>rd</sup> – 24<sup>th</sup> 2013.
- Faculty for course on “Introduction to Remotely sensed data, GIS and processing” at RVR&JC college of engineering, Guntur, Andhra Pradesh, India, June 2nd-June 5th 2013.
- Technical resource person for short course on “Use of GRASS in Image Analysis”, in IGTA 2012 at IIT Bombay, Mumbai, India during April 12<sup>th</sup> -13<sup>th</sup>, 2012.
- Faculty for course on “Remote sensing and GIS” at KITS college of engineering, Guntur, Andhra Pradesh, India, Nov 10<sup>th</sup>-Nov 15<sup>th</sup> 2012.
- Organised Free and open source software for geo informatics and technical resource person, Cistup, Indian Institute of Science, Bangalore, Delivered lectures on- “Using open source software –Grass”, “Google earth engine – time to map”, Basics of Remote sensing, Image Processing, April 1-5, 2015.
- Biodiversity Awareness Workshop using Open Source Geospatial (FOSS4G) Tools, CCE Lecture Hall, Indian Institute of Science, Bangalore, August 20, 2015
- Free & Open Source Geospatial Technologies (FOSS4G) for Urban Environment Applications (mapping, inventorying & monitoring), CCE Lecture Hall, Indian Institute of Science, Bangalore, delivered lectures on- “Intro to Open source software”, “Using open source software –Grass”, “Google earth engine – time to map”, Basics of Remote sensing, Image Processing, August 21-24, 2015.
- Science and Education in Innovit 20xv, as Chief guest, 1st September 2015, Sri AURBINDO College for Women, Bangalore, India

## Hands on training program/Workshops

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- Workshop on “Big data for better governance – Promoting data-driven policy making and governance in West Bengal” during November 28-29, 2017
- Preparatory workshop on Water Urbanism in Kolkata, October 2016 with Columbia University, USA
- Using GRASS and QGIS in workshop on “Remote sensing & GIS” at Centre for Continuing Education, Indian Institute of Science, Bangalore, India during September 17-21, 2010.
- Using open source software in KITS College of engineering, Guntur, Andhra Pradesh, India, Nov 10<sup>th</sup>-Nov 15<sup>th</sup> 2012.
- Using open source software for environmental impact assessment at RVR&JC college of engineering, Guntur, Andhra Pradesh, India, June 2nd-June 5th 2013.

- Using GRASS and QGIS in workshop on “Using Free and Open Source Geospatial (FOSS4G) Tools” on 27<sup>th</sup> Feb. 2014. 24<sup>th</sup> - 28<sup>th</sup> Feb, 2014, Indian Institute of Science, Bangalore, India
- Image processing and applications in urban management using GRASS AND R, April 1-5, 2015. At Cistup, Indian Institute of Science, Bangalore.
- Using GRASS, a quantum open source in urban application(S) in workshop on Free & Open Source Geospatial Technologies (FOSS4G) for Urban Environment Applications (mapping, inventorying & monitoring), on 23<sup>rd</sup> August. 2015. Indian Institute of Science, Bangalore, India

## Popular talks

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- Tres(s)passing – TV interview organized by Public TV on work based on assessment of number of trees using spatial data, 27<sup>th</sup> October 2014.
- Science in education – mentoring and attracting new talents in science – program organized by All India Radio on February 21<sup>st</sup> 2015.

## Articles in Popular communications

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1. Ramachandra, T.V., Bharath, S., Vinay, S., **Bharath, H.A.**, 2020. Mitigation of Carbon Footprint, Sustainable living, Yojana, 50(1), Pp 36-41
2. Jefferey M. Sellers, **Bharath Aithal**, Huang Jingnan, Uttam Kumar, Mingjun Peng, T. V. Ramachandra and Liu Yong, 2014. Mega-Regional Development and Environmental Change in China and India, APN Science Bulletin, Issue 4, pp. 116-118, UIESTF
3. Ramachandra, T.V., **Bharath, H.A.**, 2014. Geo-visualisation of Urbanisation in Greater Bangalore, Geospatial world – India geospatial digest, September 2014 issue.

## Conferences/Symposium/virtual Webinar series organized.

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- Lake 2010: Wetlands, Biodiversity and Climate Change: December 22-24<sup>th</sup> 2010. Main organiser Indian Institute of Science
- Lake 2012: Conservation and Management of Wetland Ecosystems November 06-08<sup>th</sup> 2012. Main organiser Indian Institute of Science
- Lake 2014: Conservation and Sustainable Management of Wetland Ecosystems in Western Ghats November 13<sup>th</sup>-15<sup>th</sup> 2014, Main organiser Indian Institute of Science
- International Symposium On Water Urbanism And Infrastructure Development In Eco-Sensitive Zones, organized by RCGSIDM, IIT Kharagpur, January 5-6<sup>th</sup>, 2017
- ICNDE 2018: International Conference on the Networked Digital Earth, organized by Indian Institute of Technology Kharagpur, India and Northeastern University, USA, March 7-9, 2018
- Lake 2018: Conference on Conservation and Sustainable Management of Riverine Ecosystems, November 22<sup>th</sup>-25<sup>th</sup> 2018. Main organiser Indian Institute of Science
- Symposium on Infrastructure Development and Management for Future Cities, April 17-18, 2019. Main organiser Indian Institute of Technology Kharagpur
- Lake 2020: Conference on Ecosystem Structure, Function, Goods and Services. Main organiser Indian Institute of Science
- SPARC 2021: Shared urban mobility systems – Virtual webinar series December 2021
- Lake 2022: Conservation of Wetlands -Ecosystem-based Adaptation of Climate Change, December 28-30. Main organiser Indian Institute of Science
- IBSR 2023: Annual Conference on Infrastructure and Built Environment: Towards Sustainable and Resilient Societies, February 02 – 04, 2023. Main organiser Indian Institute of Technology Kharagpur

## Reviewer (Select journals)

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- IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing (J-STARS)
- Remote sensing of the Environment
- Cities
- Springer Plus

- Journal of Environmental Engineering and Landscape Management
- Landscape and Urban planning
- Current Science
- Indian Journal of Remote Sensing
- Journal of applied geography
- Journal of The Institution of Engineers (India): Series A
- Indian Journal of Remote Sensing
- Journal of Environmental Management (**Guest Editor: ECO-Urbanism**)

## Reviewer Board/Editorial Board

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- PLOS Climate
- Imperial International Journal
- International Journal of Computer Sciences and its Applications
- SF Journal of Environmental and Earth Science, Science Forecast Publication
- Open Urban Studies and Demography Journal
- Earth Sciences

## M.Tech Thesis Guidance

### As SRF & Research Associate (@IISc) (With Dr. Ramachandra TV)

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- Harish Sethumadhavan. 2011. Maximum likelihood classifier to classify high raise and low raise buidings submitted to VTU, Belgaum, B. Tech.
- Karthik K. 2011. Maximum likelihood classifier to classify high raise and low raise buidings submitted to VTU, Belgaum, B. Tech.
- Pradeep More, 2011. Maximum likelihood classifier to classify high raise and low raise buidings submitted to VTU, Belgaum, B. Tech.
- Beas Barik, 2013. Temporal Land Surface temperature analysis across mega cities of India, Submitted to Symbiosis Institute of Geomatics, Pune, M.Tech.
- Tarun Kumar Kalal, 2014. Modelling Urban dynamics, Submitted to Karnataka State Remote Sensing and Applications centre. M.Tech.
- Nagar Nupur Anoop. 2014. Environmental snd Societal water requirements in cauvery river basin submitted to National institute of Technology, Suratkal, M.Tech.
- Chandan M C, 2015. Analysis of Urbanisation pattern and modelling of mega city of India. to be submitted to National institute of Technology, Suratkal, M.Tech.
- Swati Gupta, 2015. Prioritisation of Biodiversity Rich regions in Northern Western Ghats, submitted to Bhanasthali University, M.Sc.
- Swetha Gupta, 2015. Prioritisation of Biodiversity Rich regions in Central and Southern Western Ghats, submitted to Bhanasthali University, M.Sc.
- Revathi G., 2016 Modelling Corridor development and planning analysis. submitted to M.Tech.
- Baby Brigit Maria., 2016. Smart cities along development corridors and its impact on transport network with importance to environmental parameters. submitted to M.Tech.
- Gaurav Kumar, 2014. Analysis of Urbanisation pattern in Tier II cities of India. Submitted to Sikkim Manipal University, B.Tech.
- Devarati Kar, 2014. Analysis of Urbanisation pattern in Tier II cities of India. Submitted to Sikkim Manipal University, B.Tech.
- Nitesh, 2014. Analysis of Urbanisation pattern in Tier II cities of India. Submitted to Sikkim Manipal University, B.Tech.

## As Faculty (Post 2017) (Ongoing: 04)

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- Shafia Ahmad, 2018. Exploring linkage between Surface Urban heat Island and Urbanization through Spatial data modelling. Submitted to IIT Kharagpur, M.Tech.
- Gaurav Kumar, 2018. Flood Vulnerability Zoning using Remote Sensing and GIS. Submitted to IIT Kharagpur, M.Tech.
- Bhumika Purmar, 2019. Modelling Spatio-Temporal land use change in Kolkata. Submitted to Gujarat University, M.Tech.
- Shrawani Sable, 2019. Estimation of land surface temperature with relation to land use land cover. Submitted to CEPT university, M.Tech.
- Satrupa Mitra, 2019. Extraction of building footprint through machine learning. Submitted to Symbiosis Institute of Geomatics, Pune, M.Tech.
- Akshit Shah, 2019. Spatio-temporal dynamics of housing demand and supply in ward-e, Mumbai. Submitted to IIT Kharagpur, M.Tech.
- Aher Abhishek Yashwant, 2019. Submitted to IIT Kharagpur, M.Tech.
- Soumya Kantha Das, 2020. Urban Surface Simulation through Image-to-Image Translation Deep Learning Algorithms Using Single Optical UAV Imagery, Submitted to Central University of Jharkand, M.S
- Abhimanyu D, 2020. Exposition of Urban Dynamics and Modelling of Urban Growth, Submitted to IIT Kharagpur, M.Tech
- Nishant Raj Tonk, 2021. Mitigating The Impacts Of Rising Land Surface Temperature Over Urban Areas, Submitted to IIT Kharagpur, M.Tech
- Vishal Kumar Singh, 2021. Evaluation Of Rooftop Solar Photovoltaic Potential Using Machine Learning And Geoinformatics. Submitted to IIT Kharagpur, M.Tech
- Mohit Verma, 2021. Web-Based Spatial Urban Decision Support System, Submitted to IIT Kharagpur, M.Tech
- Parul Sharma, 2021. Developing A Macro Level Strategy For Coastal Flood Risk Mitigation In Rural Areas, Submitted to IIT Kharagpur, M.Tech
- Gargi Dwivedi, 2022. Quantification Of The Impact Of Mitigation Strategies On Land Surface Temperature, Submitted to IIT Kharagpur, M.Tech
- Mudholkar Lalit Dattaram, 2022. GIS-Based Suitability Analysis for Siting Solar Power Plants and its Environmental Monitoring, Submitted to IIT Kharagpur, M.Tech
- Shantanu Anand, 2022. Environmental Impact Evaluation Of Bio-Medical Waste Management Practices Using Life Cycle Assessment. Submitted to IIT Kharagpur, M.Tech

## Ph.D Thesis Guidance (Ongoing: 5)

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- **Tanaya, S.**, A Methodology For Prioritizing Critical Infrastructures For Urban Flood-Prone Areas:A Case Of Guwahati, Assam (With Dr. Sutapa Das, IEST Shibpur), **Awarded (Aug 2016 -Feb 2021)**
- **Chandan, M.C.**, Urban Land Use Modelling And Developing A Framework Of Spatial Decision Support System For Indian Cities, **Awarded (Jan 2017- June 2021)**
- **Prakash, P.S.**, Algorithms to develop extraction of 3D surfaces, **Awarded (Jan 2018- Nov 2021)**
- **Nimish, G.**, Land Surface Temperature extraction and Modelling, **Awarded (Aug 2017-June 2022)**
- Aishwarya Narendr, Development of Framework for Flood Vulnerable Regions (With Dr. Sutapa Das, IEST Shibpur), **Submitted (Aug 2018-)**
- **Ram Tilak**, Developing Unified Framework of Spectral - Spatial Classification of Hyperspectral Images for Urban Applications, **Ongoing (Aug 2018-)**
- **Madhumita Dey**, Deep learning urban informatics, **Ongoing (Aug 2020-)**
- **Aniruddha Khatua**, Deep learning in land and transport, Regions (With Dr. Arkopal K Goswami, IIT Kharagpur), **ongoing (Aug 2021-)**

- **Anita Gautam**, Land use modelling using machine learning, *ongoing (Aug 2021-)*
- **Anurag Aman Kaushal**, Scientific validation of Vastu Shastra through Building IEQ and Energy Efficiency Studies, *ongoing (Aug 2021-)*

## Post Doctoral Guidance

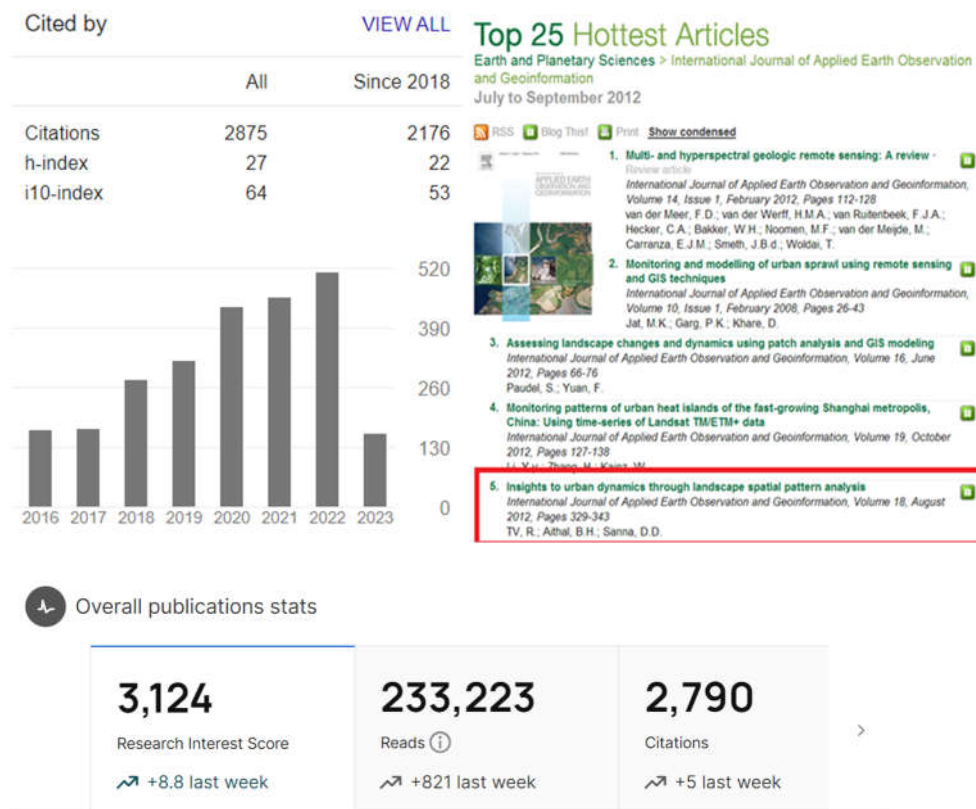
**Dr. Vinay S**, Forecasting and Evaluation of Impacts and Risk Due to Tidal Anomalies on Coastal Island of Sagar, Sunderban eco-sensitive region, Institute Post Doctoral Fellow. 2020-2021.

## Doctoral Thesis examiner

1. **Hari om Singh** –2019: Thesis title: “GEOSTATISTICAL COMPUTING AS WEB PROCESSING SERVICE USING OPEN SYSTEM ARCHITECTURE”: Civil Engineering, *Indian Institute of Technology Roorkee* (USN:13914010)
2. **MEENA Y.R.** – 2021: Thesis title: “Applications of Geo-spatial Modeling Techniques for Urban Storm Water Flood Control of Bengaluru City Using Best Management Practices”: *Visvesvaraya Technological University* (USN: 5VX12PCN10)
3. **Roopa M R** –2022: Thesis Title: “Design of a Predictive Model to Estimate Mode of Transport and Travel time in Metropolitan Cities using Reinforcement Learning”: Computer Science and Engineering, *Visvesvaraya Technological University* (USN:1RV16PEJ36)

## MS Thesis examiner

1. **Deeksha Aggarwal** –2022: Thesis Title: “Towards Building Self-evolving Online Learning Deep Neural Network Models for Data Stream Classification”: International Institute of Information Technology, Bangalore (USN: MS2019006)



## Declaration

I hereby declare that all the details furnished above are true to the best of my knowledge and conscience.

**Bharath H Aithal**  
 Tuesday, 23 May 2023