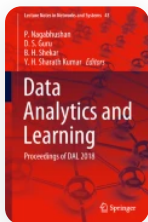


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Urban LULC Change Detection and Mapping Spatial Variations of Aurangabad City Using IRS LISS-III Temporal Datasets and Supervised Classification Approach

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Abstract

An accurate mapping of urban LULC is essential for urban development and planning. Although urban area represents a little portion of Earth surface, which brings an unbalanced impact on its surrounding areas. However urban LULC mapping and change

Loading [MathJax]/jax/output/HTML-CSS/config.js Recent advances in Geospatial

technology can be used to map built-up areas for detecting the urban growth patterns. In this work IRS LISS-III sensors image data of 2003, 2009, and 2015 of same season were used. The LULC mapping and change detection was carried out by four supervised classifier namely Maximumlikelihood classifier (MLC), Mahalanobis-Distance (MD), Minimum-Distance-to-Means (MDM), and Parallelepiped classifier (PC). Obtained results were examined by considering the efficiency of each classifier to accurately map the identified LULC classes. It is observed that, MLC has given the highest overall accuracy of 73.07, 83.51, and 93.43% with kappa coefficient of 0.64, 0.78, and 0.90 in 2003, 2009, and 2015 respectively, which are superior among others; hence we have used classified layer obtained from MLC for further change detection and analysis from 2003 to 2015.

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References

1. Islam, K., Jashimuddin, M., Nath, B., Nath, T.K.: Land use classification and change detection by using multi-temporal remotely sensed imagery: the case of Chunati wildlife sanctuary, Bangladesh. *Egypt. J. Remote Sens. Space Sci.* (2017)
[Google Scholar](#)
2. Rawat, J.S., Kumar, M.: Monitoring land use/cover change using remote sensing and GIS techniques: a case study of Hawalbagh block, district Almora, Uttarakhand, India. *Egypt. J. Remote Sens. Space Sci.* **18**(1), 77–84 (2015)
[Article](#) [Google Scholar](#)
3. Reis, S.: Analyzing land use/land cover changes using remote sensing and GIS in Rize, North-East Turkey. *Sensors* **8**(10), 6188–6202 (2008)
[Article](#) [Google Scholar](#)
4. Lu, D., Mausel, P., Brondízio, E., Moran, E.: Change detection techniques. *Int. J. Remote Sens.* **25**(12), 2365–2401 (2004).
<https://doi.org/10.1080/0143116031000139863>
[Article](#) [Google Scholar](#)
5. Nagne, A.D., Dhumal, R.K., Vibhute, A.D., Rajendra, Y.D., Kale, K.V., Mehrotra, S.C.:
Loading [MathJax]/jax/output/HTML-CSS/config.js [umping using RS and GIS approach: a case](#)

study of Aurangabad, MS, India. In: 2014 Annual IEEE India Conference (INDICON), pp. 1–6. IEEE (2014)

[Google Scholar](#)

6. Balpande, U.S.: Ground_Water Information of Aurangabad District Maharashtra, Ministry of Water Resources Central Ground Water Board, Gov. of India, 1791/DBR/201. http://cgwb.gov.in/District_Profile/Maharashtra/Aurangabad.pdf
7. Nagne, A.D., Dhumal, R.K., Vibhute, A.D., Gaikwad, S., Kale, K., Mehrotra, S.: Land use land cover change detection by different supervised classifiers on LISS-III temporal datasets. In: 2017 1st International Conference on Intelligent Systems and Information Management (ICISIM) (2017)

[Google Scholar](#)

8. Resourcesat—1 Data User's Handbook, National Remote Sensing Agency, Department Of Space, Govt. Of India NrsaBalanagar, Hyderabad—500037, A.P. India. http://Bhuvan.Nrsc.Gov.In/Bhuvan/Pdf/Resourcesat-1_Handbook.Pdf
9. Hebbara, R., SessaSaib, M.V.R.: Comparison of LISS-IV MX AND LISS-III+ LISS-IV merged data for classification of crops. ISPRS Ann. Photogramm. Remote Sens. Spatial Inf. Sci. (ISPRS Technical Commission VIII Symposium, 09–12 December 2014, Hyderabad, India) II(8) (2014)

[Google Scholar](#)

10. Vibhute, A.D., Dhumal, R.K., Nagne, A.D., Rajendra, Y.D., Kale, K.V., Mehrotra, S.C.: Analysis, classification, and estimation of pattern for land of Aurangabad region using high-resolution satellite image. In: Proceedings of the Second International Conference on Computer and Communication Technologies, pp. 413–427. Springer, New Delhi (2016)

Loading [MathJax]/jax/output/HTML-CSS/config.js

[Google Scholar](#)

11. Govender, M., Chetty, K., Bulcock, H.: A review of hyperspectral remote sensing and its application in vegetation and water resource studies. *Water SA* 33(2) (2007). ISSN 0378-4738. *Water SA* (on-line). ISSN 1816-7950. <http://www.wrc.org.za>
12. Srivastava, P.K., Han, D., Rico-Ramirez, M.A., Bray, M., Islam, T.: Selection of classification techniques for land use/land cover change investigation. *Adv. Space Res.* 50(9), 1250–1265 (2012)

[Article](#) [Google Scholar](#)

13. Murtaza, K.O., Romshoo, S.A.: Determining the suitability and accuracy of various statistical algorithms for satellite data classification. *Int. J. Geomat. Geosci.* 4(4), 585 (2014)

[Google Scholar](#)

14. Gao, J.: *Digital Analysis of Remotely Sensed Imagery*. McGraw-Hill Professional (2008)

[Google Scholar](#)

15. Banko, G.: A review of assessing the accuracy of classifications of remotely sensed data and of methods including remote sensing data in forest inventory (1998)

[Google Scholar](#)

16. Sinha, S., Sharma, L.K., Nathawat, M.S.: Improved land-use/land-cover classification of semi-arid deciduous forest landscape using thermal remote sensing. *Egypt. J. Remote Sens. Space Sci.* 18(2), 217–233 (2015)

[Article](#) [Google Scholar](#)

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17. Jayanth, J., Kumar, T.A., Koliwad, S., Krishnashastry, S.: Identification of land cover changes in the coastal area of Dakshina Kannada district, South India during the year 2004–2008. *Egypt. J. Remote Sens. Space Sci.* **19**(1), 73–93 (2016)

[Article](#) [Google Scholar](#)

18. Butt, A., Shabbir, R., Ahmad, S.S., Aziz, N.: Land use change mapping and analysis using Remote Sensing and GIS: a case study of Simly watershed, Islamabad, Pakistan. *Egypt. J. Remote Sens. Space Sci.* **18**(2), 251–259 (2015)

[Article](#) [Google Scholar](#)

19. Beuchle, R., Grecchi, R.C., Shimabukuro, Y.E., Seliger, R., Eva, H.D., Sano, E., Achard, F.: Land cover changes in the Brazilian Cerrado and Caatinga biomes from 1990 to 2010 based on a systematic remote sensing sampling approach. *Appl. Geogr.* **58**, 116–127 (2015)

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