

Prakhar Misra

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Keywords: Remote sensing applications, Land-use change, Urbanization and emission inventory, Biomass burning, Urban air pollution, Social sensing, Low-cost portable sensors, Deep learning, Google Earth Engine, Open data

Experience

- 2021/6 - **Synspective Inc., Tokyo, Japan, SAR Application Engineer.**
Geo-spatial solutions development, operation, and maintenance.
- 2020/4 - **Research Institute of Humanity and Nature, Kyoto, Japan, Researcher.**
- 2021/3 *'Interdisciplinary study towards clean air, public health and sustainable agriculture: case of crop residue burning in India.'*
- 2019/10 - **Institute of Industrial Science, The University of Tokyo, Specially Appointed Assistant**
- 2020/3 *Professor.*
- 2018/08 - **Institute of Industrial Science, The University of Tokyo, Project Researcher.**
- 2019/10 Researching agromet cross comparison and validation for rice crop outlook in Thailand.
- 2015/10 - **Sony Computer Science Laboratories, Tokyo, Japan, Research Assistant.**
- 2016/12 Analyzed energy exchange efficiency in *'Open Energy System'* for decentralized PV grid.
- 2013/06 - **Inductis, New Delhi, India, Consultant.**
- 2015/02 Predictive modelling of unsecuritized credit risk. Awarded 'Best Team' and 'Star Performer'.
- 2011/05 - **Bharat Petroleum Corporation Limited, Mumbai, India, Internship.**
- 2011/06 Performed energy audit and feasibility study for solar-wind powered renewable energy plant.

Education

- 2015–2018 **PhD, Civil Engineering (Remote Sensing), The University of Tokyo, Japan,**
Title: Analyzing Impact of Socio-economic Growth and Land-use Change on Urban Air Quality in India, GPA 3.7/4. Advisor: Dr. Wataru Takeuchi.
- 2008–2013 **B.Tech-M.Tech, Civil Engineering (Geoinformatics), Indian Institute of Technology Kanpur (IIT Kanpur), India,**
Title: Multi-resolution Segmentation Based Classification of Polarimetric SAR Imagery, BTech CPI 6.7/10, MTech CPI 8.8/10. Advisor: Dr. Onkar Dikshit.

Publications (peer-reviewed)

1. **Misra P.**, Takigawa M., Khatri P., Dhaka S.K., Dimri A.P., Yamaji K., Kajino M., Takeuchi W., Imasu R., Patra P.K. Hayashida S.; NO₂ Concentration and Emission change detection during COVID-19 restrictions in North India. *Nature Scientific Reports*, 11, 9800, (2021).
2. Rahman M.M., Avtar R., Ahmed S., Inostroza L., **Misra P.**, Kumar P., Takeuchi W., Surjan A., Saito O.; Does Building Development in Dhaka Comply Land Use Zoning? Analysis Using Nighttime Light and Digital Building Heights. *Sustainability Science*, 16, 1323-1340, (2021).
3. Nguyen T.T.Q., Takeuchi W., **Misra P.**, Hayashida S.; Emission mapping of key sectors in Ho Chi Minh city, Vietnam using satellite derived urban land-use data. *Atmospheric Chemistry and Physics*, 21, 2795-2818, (2021).
4. Avtar R., Kouser K., Kumar A., Singh D., **Misra P.**, Gupta A., Yunus A.P., Kumar P., Johnson B.A., Dasgupta R., Sahu N., Rimba A.B.; Remote Sensing for International Peace and Security: Its Role and Implications. *Remote Sensing*, Vol 13(3), 439, (2021).
5. Avtar R., Singh D., Umarhadi D.A., Yunus A.P., **Misra P.**, Desai P.N., Kouser A., Kurniawan T.A., Phanindra K.B.V.N.; Impact of COVID-19 Lockdown on the Fisheries Sector: A Case Study from Three Harbors in Western

- India. *Remote Sensing*, Vol 13(2), 183, (2021) .
6. **Misra P.**, Imasu R., Hayashida S., Ardhi A., Takeuchi W.; Mapping Brick Kilns to support Environmental Impact Studies around Delhi using Sentinel-2. *ISPRS International Journal of Geo-Information*, Vol 9(9), 544, (2020).
 7. Dhaka S.K., Chetna, Kumar V., Panwar V., Dimri A.P., Singh N., Patra P.K., Matsumi Y., Takigawa M., Nakayama T., Yamaji K., Kajino M., **Misra P.**, Hayashida S.; PM_{2.5} diminution and mist events over Delhi during the COVID-19 lockdown period: an interplay between the baseline pollution and meteorology. *Nature Scientific Reports*, 10, 13442, (2020).
 8. Rahman M.M., Avtar R., Yunus A.P., Dou J., **Misra P.**, Takeuchi W., Sahu N., Kumar P., Johnson B.A., Dasgupta R., Kharrazi A., Chakraborty S., Agustiono K.T.; Monitoring Effect of Spatial Growth on Land Surface Temperature in Dhaka. *Remote Sensing*, Vol 12(7), 1191, (2020).
 9. **Misra P.**, Takeuchi W.; Assessing Population Sensitivity to Urban Air Pollution Using Google Trends and Remote Sensing Datasets. *Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci.*, XLII-3/W11, 93-100, (2020).
 10. **Misra P.**, Imasu R., Takeuchi W.; Impact of Urban Growth on Air Quality in Indian Cities Using Hierarchical Bayesian Approach. *Atmosphere*, Vol 10(9), 517, (2019).
 11. Minh H.V.T., Avtar R., Mohan G., **Misra P.**, Kurasaki M.; Monitoring and Mapping of Rice Cropping Pattern in Flooding Area in the Vietnamese Mekong Delta Using Sentinel-1A Data: A Case of An Giang Province. *ISPRS International Journal of Geo-Information*, Vol 8(5), 211, (2019).
 12. **Misra P.**, Avtar R., Takeuchi W.; Comparison of digital building height models extracted from AW3D, TanDEM-X, ASTER and SRTM digital surface model over Yangon city. *Remote Sensing*, Vol 10(12), 2008, (2018).
 13. **Misra P.**, Fujikawa A., Takeuchi W.; Novel Decomposition Scheme for Characterizing Urban Air Quality with MODIS. *Remote Sensing*, Vol 9(8), 812, (2017) .
 14. **Misra P.**, Takeuchi W.; Air Quality Analysis Using Nighttime Light for Indian Urban Regions. *Malaysian Journal of Remote Sensing and GIS*, Vol 5(2), (2016).

Publications (under review/preparation)

1. Nitta K., **Misra P.**, Hayashida S.; Intercomparison of TROPOMI and OMI tropospheric Nitrogen Dioxide over South Asia. under 2nd review.
2. Soviso E., Kuntal V.S., **Misra P.**, Takeuchi W., Nagai K.; Estimation of Bridge Construction years in Cambodia by Analysis of the Normalized Difference Water Index of Landsat Satellite Data. *Remote Sensing* under preparation.

Publications (conference)

1. **Misra P.**, Takigawa M., Khatri P., Dhaka S.K., Dimri A.P., Yamaji K., Kajino M., Takeuchi W., Imasu R., Patra P.K. Hayashida S.; Detection of significant change in nitrogen oxides concentration and emission during COVID-19 lockdown in North India. *2020 AGU Fall Meeting*, San Francisco, USA, 2020.
2. Hayashida S., **Misra P.**, Nitta K., Nguyen T.H., Patra P.K., Takigawa M., Khatri P., Dhaka S.K., Dimri A.P., Yamaji K., Takeuchi W.; Reduction of air pollutants over North-West India observed from space during the Covid-19 lockdown period. *2020 AGU Fall Meeting*, San Francisco, USA, 2020.
3. Nguyen T.H., Hayashida S., **Misra P.**, Matsumi Y., Nakayama T., Dhaka S.K., Dimri A.P.; Detection of Change in the Aerosol distribution over North-West India during the Covid-19 Lockdown period. *2020 AGU Fall Meeting*, San Francisco, USA, 2020.
4. **Misra P.**, Takeuchi W., Imasu R.; Brick Kiln Detection in North India with Sentinel imagery using Deep Learning of Small Datasets. *40th Asian Conference of Remote Sensing*, Daejeon, South Korea, 2019.
5. **Misra P.**, Takeuchi W.; Assessing population sensitivity to urban air pollution using Google Trends and remote sensing datasets. *40th Pecora21/ISRSE38*, Baltimore, Maryland, USA, 2019.
6. Soviso E., Thakur V.B., Nagai K., **Misra P.**, Takeuchi W.; Estimation of the bridge construction year in Cambodia by the analysis of LANDSAT satellite data. *3rd ACF Symposium*, Sapporo, Japan, 2019.
7. **Misra P.**, Takeuchi W.; Use of Google Trends for Assessing Sensitivity of Population to Urban Air Pollution. *26th International Symposium on Remote Sensing*, Taipei, Taiwan, 2019.
8. Arbain A., Imasu R., **Misra P.**, Takeuchi W.; Estimating PM_{2.5} Emission from Brick Kiln Industry over Northern India with Numerical Model and Remote Sensing Observation. *EGU General Assembly*, Vienna, Austria, 2019.
9. **Misra P.**, Takeuchi W.; Analyzing perception of urban air pollution using Google Trends and satellite datasets. *27th Institute of Industrial Science Forum Proceedings*, Tokyo, Japan, 2019.

10. **Misra P.**, Takeuchi W.; A Novel Technique For Estimating Expansion Of Residential, Commercial And Industrial Regions In Indian Megacities. *17th International Symposium on Urban Safety Of Mega Cities In Asia*, Hyderabad, India, 2018.
11. **Best Paper Award Finalist Misra P.**, Imasu R., Takeuchi W.; Land-use Change Impacts on Urban Air Quality in India using Hierarchical Bayesian Approach. *39th Asian Conference of Remote Sensing*, Kuala Lumpur, Malaysia, 2018.
12. Ochi S., **Misra P.**, Takeuchi W.; Spatiotemporal Distribution Of Hotspot / Wildfire In Southeast Asia Using Remote Sensing Data. *39th Asian Conference of Remote Sensing*, Kuala Lumpur, Malaysia, 2018.
13. **Best Paper Award Misra P.**, Takeuchi W.; Hierarchical Bayesian approach to estimate land-use change impacts on urban air pollution in India. *26th Institute of Industrial Science Forum Proceedings*, Tokyo, Japan, 2018. .
14. **Misra P.**, Takeuchi W.; Digital Surface Model (DSM) datasets for built-height estimation over Indian cities. *24th International Symposium on Remote Sensing*, Nagoya, Japan, 2017.
15. **Misra P.**, Takeuchi W.; Comparison of ASTER and AW3D derived Digital Surface Model datasets for built structure height estimation over Yangon city, Myanmar. *25th Institute of Industrial Science Forum Proceedings*, Tokyo, Japan, 2017.
16. **Misra P.**, Takeuchi W.; Assessing Impact of Economic Activities on Urban Air Quality in India by Nightlight and Atmospheric Measurement Datasets. *37th Asian Conference of Remote Sensing*, Colombo, Sri Lanka, 2016.
17. **Misra P.**, Takeuchi W.; Air Quality Analysis Using Nighttime Light for Indian Urban Regions. *8th IGRSM International Conference and Exhibition on Geospatial & Remote Sensing*, Kuala Lumpur, Malaysia, 2016.
18. **Misra P.**, Takeuchi W.; Analysis Of Air Quality In Indian Cities Using Remote Sensing And Economic Growth Parameters. *36th Asian Conference on Remote Sensing*, Manila, Philippines, 2015.

Reports

- **Misra P.**; Clean Air and Imagined Sustainability: The case of India. *Aakash Newsletter*, Vol. 1(1) 2020.
- **Misra P.**, Sharma R.; India's GAGAN (GPS-aided GEO augmented navigation) adds a new dimension to navigation. *GIM International*, Vol. 27(2) 2013.

Presentation and seminars

1. **(invited)** Impact of COVID-19 lockdown on NO_x concentrations and emissions in North India *Knowledge Sharing Symposium on Machine Learning and Deep Learning in Geoinformatics, Hokkaido University*, online. (2020/11/30)
2. **(invited)** Remote Sensing for Air Quality Management *Remote Sensing Application on Contemporary Environmental Issues, Pabna University of Science & Technology, Bangladesh*, online. (2020/11/24)
3. **(invited)** Impact of Urban Growth on Air Quality in Indian Cities *FTSP New Normal Webinar, Institut Teknologi Nasional, Bandung*, online. (2020/06/25)
4. Public interest in air quality and its impact varies with baseline exposure: Google Trends and Remote Sensing based analysis *22nd CERES Symposium on Environment Remote Sensing, Chiba University, Chiba, Japan*. (2020/02/20)
5. **(invited)** Remote Sensing for Urban Studies Mapping Land-use for Emission Inventories in Developing Countries *Young Sustainability Symposium, Hokkaido University, Sapporo, Japan*. (2020/02/03)
6. **(invited)** Mapping Drivers of Urban Air-pollution in Indian Cities using Remote Sensing *Sakura Science Exchange Program, Shibaura Institute of Technology, Tokyo, Japan*. (2019/11/20)
7. Monitoring Land-use Drivers of Urban Air Pollution and its Response using Remote Sensing and Social Sensing *Data-based Society Creation Symposium 2019, Tokyo, Japan*. (2019/09/01)
8. Brick kiln detection around New Delhi using Sentinel 2 with Deep Learning: Distribution and Drivers *NASA LCLUC SARI International Regional Science Meeting, Johor Bahru, Malaysia*. (2019/07/24)
9. Comparison of Remote Sensing derived KBDI with in-site Soil-moisture in Thailand. *JAXA-GISTDA mini workshop on drought monitoring, Bangkok, Thailand*. (2019/05/17)
10. Observations from Mapping PM_{2.5} in Indian Cities using Low-cost sensor. *1st IITK-UTokyo Workshop on PM_{2.5} Mapping using Low-cost Sensors, Kanpur, India*. (2019/02/06)
11. Role of satellite for monitoring urban air quality. *1st IITK-UTokyo Workshop on PM_{2.5} Mapping using Low-cost Sensors, Kanpur, India*. (2019/02/07)
12. GEE as educational tool in Civil Engineering. *Google Earth Engine Year-end Meetup in Tokyo, Tokyo, Japan*.

(2018/12/26)

13. Impact assessment of socio economic development on urban air quality in Indian megacities NASA LCLUC SARI International Regional Science Meeting, Chiang Mai, Thailand. (2017/07/17)

Workshops and training organized

- 2020 (invited) Knowledge Sharing Symposium on Machine Learning and Deep Learning in Geoinformatics, Hokkaido University Multi-temporal land-cover Classification using Cloud Platform (12/1)
- 2019 (invited) NASA SARI Remote Sensing Land Use change and Climate Impacts in Coastal Zone Regional Science Training, Phuket, Thailand Blue Carbon Mapping and Coastal Zone studies using GEE (12/17)
- 2019 (invited) 5th International Conferences of Indonesian Society for Remote Sensing (ICOIRS), Bandung, Indonesia Cloud based satellite image processing: Introduction to GEE (09/17)
- 2019 (invited) Suranaree University of Technology, Nakhon Ratchaseema, Thailand Air quality monitoring and mapping with portable devices (05/15)
- 2019 4th Open Science Meeting, Global Land Program, Bern, Switzerland Hands-on-training session on evaluating three-dimensional urban expansion in mega cities in Asia (04/27)
- 2019 (invited) 26th International Symposium on Remote Sensing - ISPRS TC-W/8 Tutorial, Taipei, Taiwan Remote Sensing Applications using Google Earth Engine (04/18)
- 2019 1st IITK-UTokyo Workshop on PM_{2.5} Mapping using Low-cost Sensors, IIT Kanpur, India Citizen science workshop for mapping geolocated individual exposure to PM 2.5 using low-cost devices. (02/05–02/07)
- 2019 (invited) 27th IIS Forum, The University of Tokyo, Tokyo, Japan Classifying Landsat8 imagery using Google Earth Engine (03/07–03/08)
- 2018 Indian Institute of Technology-BHU, Varanasi, India Classifying Landsat8 imagery using Google Earth Engine and demonstration of portable PM_{2.5} sensors (06/04)
- 2018 (invited) 26th IIS Forum, The University of Tokyo, Tokyo, Japan Google Earth Engine for Landsat imagery classification (03/07–03/08)

Teaching

(*team-teaching, +teaching-assistant)

- 2019, '18, '17 Remote sensing (3713-089)*, The University of Tokyo, Tokyo, Japan.
- 2019/01 Satellite Image Processing for Remote Sensing Applications*, Seoul National University, South Korea.
- 2013/01 Precision Remote Sensing (CE676)⁺, IIT Kanpur, India.
- 2012/08 Environmental Quality and Pollution (CE361)⁺, IIT Kanpur, India.

Fellowship and grants

- 2019 Tateishi Science and Technology Foundation, USD 4000
- 2019 International research meeting dispatch grant (IIS), USD 3500; (declined)
- 2015 Japanese Government (MEXT) Scholarship; tuition and stipend
- 2009 Incentive Scheme for Meritorious Children by State Bank of India; stipend
- 2006 National Talent Search (NTSE) Scholarship by Government of India; stipend

Technical skills

- Programming Python, R, JavaScript, C, SQL, VBA, SAS
- Tools Google Earth Engine, QGIS, SNAP, ArcGIS, ENVI, TerraScan, GDAL

Professional service

- Guest Editor MDPI Remote Sensing

- Reviewer MDPI Remote Sensing; MDPI Atmosphere; T&F International Journal of Remote Sensing, Elsevier Resources Conservation and Recycling; Springer Sustainability Science
- Member American Geophysical Union (AGU), American Society of Photogrammetry and Remote Sensing (ASPRS), Remote Sensing Society of Japan (RSSJ) (applied), Integrated Land Ecosystem-Atmosphere Processes Study Early Career Scientist Network (iLeaps), Global Land Program (GLP)

Social service

- 2016-'17 Vice-president, University of Tokyo Indian Students' Association
- 2016/07 Global Health Entrepreneurship Program for improving health in Onagawa, Miyagi
- 2015/05 Student volunteer, Empowerment Program Ibaraki High School, Mito City
- 2014-'15 SPOC, NGO for underprivileged Udayan Care, Gurgaon, India
- 2009-'10 Student guide, Institute Counselling Service, IIT Kanpur

References

Prof. Sachiko HAYASHIDA
Nara Women's University, Nara
Research Institute of Humanity and Nature, Kyoto
President, Remote Sensing Society of Japan
(shayashida@cc.nara-wu.ac.jp)

Prof. Ryoichi IMASU
Atmosphere and Ocean Research Institute
The University of Tokyo
Chiba, Japan
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Prof. Wataru TAKEUCHI
Department of Civil Engineering
The University of Tokyo
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Indian Institute of Technology Kanpur
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