

Dr. Muhammad Bilal (Distinguished Professor)

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Education

- * **Ph.D. (Remote Sensing)** – The Hong Kong Polytechnic University, HongKong (**JUL 2010–JAN 2014**)
Thesis Title: Monitoring of fine particulates in Hong Kong and Pearl River Delta region using Remote Sensing.
- * **MS (Meteorology & Remote Sensing)** – COMSATS University Islamabad, Pakistan (**SEP 2008–APR 2010**)
Thesis Title: Application of Snowmelt Runoff Model (SRM) on Indus Basin in Northern Pakistan
- * **BS (Space Science)** – University of the Punjab (PU), Lahore, Pakistan (**JAN 2004–FEB 2008**)

Research Interests

- Aerosol Remote Sensing
- Estimation of PM_{2.5} and PM₁₀
- Dust Storm Monitoring and Air Quality Modeling
- Urban Heat Island effect
- Snow Cover Mapping
- Aerosol Optical Depth Retrieval Algorithm
- Atmospheric Correction
- Water Quality Monitoring
- Snowmelt Runoff Model (SRM)

Distinctions & Awards

- * Received **Distinguished Professor** Award from Jiangsu Provincial Department of Education, China (**JUN 2018**)
- * **Top Peer Reviewer Awards** received from Publons – is part of Web of Science Group (**2017 & 2018**)
- * Received **Hong Kong Ph.D. Fellowship** 2010/2011 (**Only I was selected among 300 candidates from Pakistan**) from Research Grants Council (RGC), Hong Kong (**JUL 2010–JUL 2013**).
- * Received **Excellent Poster Award** at "Advance training course on Ocean Remote Sensing" held at Chinese University of Hong Kong (**21-26 OCT 2013**).
- * Received **Merit Scholarship** for MS studies from COMSATS University Islamabad, Pakistan (**SEP 2008-MAR 2010**).
- * Received **Merit Scholarships** for BS studies from University of the Punjab, Lahore, Pakistan (**2005, 2006 and 2007**).

Major Projects

- * **PI** – Special project of Jiangsu Distinguished Professor – Grant No. 1421061801003 (1M Chinese Yuan) (**OCT 2018-OCT2021**)
- * **Co-PI**: Research Capability Grant of King Khalid University, Saudi Arabia – Grant No. RGP2/54/40 (190K Saudi Riyal) (**2018-2019**)

Work Experience

- * **Distinguished Professor** – Jiangsu Province, China (**JUN 2018–Present**)
- * **Professor** – School of Marine Sciences, Nanjing University of Information Science & Technology (NUIST) (**Oct 2017–Present**).
- * **Postdoctoral Fellow** – Department of Land Surveying and Geo-Informatics, The HK PolyU HK (**MAR 2014–SEP 2017**)
- * **Site Manager** – PolyU Aerosol Robotic Network (AERONET) (**JUN 2014–MAY 2017**)
- * **Administrator** – Linux Server for Weather Research & Forecasting Model (WRF–ARW) (**JUN 2012–MAY 2017**)
- * **Research Assistant** – Department of Land Surveying & Geo-Informatics, The HK PolyU HK (**OCT 2013–JAN 2014**).
- * **Research Associate** – Department of Land Surveying & Geo-Informatics, The HK PolyU HK (**AUG 2013**).
- * **Site Operator** – PolyU Aerosol Robotic Network (AERONET) (**JAN 2011 to DEC 2012**)
- * **Site Operator** – PolyU Aerosol Lidar (**JAN 2011 to DEC 2012**)

Publications

1. **Bilal, M.**; Nazeer, M.; Nichol, J.E.; Bleiweiss, M.P.; Qiu, Z.; Jäkel, E.; Campbell, J.R.; Atique, L.; Huang, X.; Lolli, S. A Simplified and Robust Surface Reflectance Estimation Method (SREM) for Use over Diverse Land Surfaces Using Multi-Sensor Data. *Remote Sens.* 2019, *11*, 1344.
2. **Bilal, M.**; Nazeer, M.; Nichol, J.; Qiu, Z.; Wang, L.; Bleiweiss, M.P.; Shen, X.; Campbell, J.R.; Lolli, S. Evaluation of Terra-MODIS C6 and C6.1 Aerosol Products against Beijing, XiangHe, and Xinglong AERONET Sites in China during 2004-2014. *Remote Sens.* 2019, *11*, 486.

3. Rupakheti, D., Kang, S, **Bilal, M.**, Gong, J., Xia, X., Cong, Z. (2019). Aerosol optical depth climatology over Central Asian countries based on Aqua-MODIS Collection 6.1 data: Aerosol variations and sources. *Atmospheric Environment*, 207, 205-214.
4. Tang, Q.; Wang, S.; Qiu, Z.; Sun, D.; **Bilal, M.** Variability of the Suspended Particle Cross-Sectional Area in the Bohai Sea and Yellow Sea. *Remote Sens.* **2019**, *11*, 1187.
5. Karimi, N., Namdari, S. Srooshian, A., **Bilal, M.**, and Heidary, P. (2019). Evaluation and modification of SARA high-resolution AOD retrieval algorithm during high dust loading conditions over bright desert surfaces. *Atmospheric Pollution Research*, doi: 10.1016/j.apr.2019.01.008
6. Shen, X., **Bilal, M.**, Qiu, Z, Sun, D., Wang, S., Zhu, W. (2019). Long-term spatiotemporal variations of aerosol optical depth over Yellow and Bohai Sea. *Environmental Science and Pollution Research*, doi: 10.1007/s11356-019-04203-4.
7. Xie, Y., Wang, Y. **Bilal, M.** *, Dong. W. (2019). Mapping daily PM_{2.5} at 500 m resolution over Beijing with improved hazy day performance. *Science of The Total Environment*, 659, 410-418.
8. HJ Chu, **M Bilal** * (2019). PM_{2.5} mapping using integrated geographically temporally weighted regression (GTWR) and random sample consensus (RANSAC) models. *Environmental Science and Pollution Research*, 26 (2), 1902-1910
9. J Wei, L Sun, Y Peng, L Wang, Z Zhang, **M Bilal**, Y Ma (2018). An improved high-spatial-resolution aerosol retrieval algorithm for MODIS images over land. *Journal of Geophysical Research: Atmospheres*, doi: 10.1029/2017JD027795
10. Z Qiu, Z Li, **M Bilal**, S Wang, D Sun, Y Chen (2018). Automatic method to monitor floating macroalgae blooms based on multilayer perceptron: case study of Yellow Sea using GOCI images, *Optics Express*, 26 (21), 26810-26829.
11. K Qin, J Zou, J Guo, M Lu, **M Bilal**, K Zhang, F Ma, Y Zhang (2018). Estimating PM1 concentrations from MODIS over Yangtze River Delta of China during 2014–2017, *Atmospheric Environment*, doi: 10.1016/j.atmosenv.2018.09.054.
12. W Qin, Y Liu, L Wang, A Lin, X Xia, H Che, **M Bilal**, M Zhang (2018). Characteristic and Driving Factors of Aerosol Optical Depth over Mainland China during 1980–2017, *Remote Sensing* 10 (7), 1064.
13. W Qin, L Wang, A Lin, M Zhang, **M Bilal** (2018). Improving the Estimation of Daily Aerosol Optical Depth and Aerosol Radiative Effect Using an Optimized Artificial Neural Network, *Remote Sensing* 10 (7), 1022.
14. Y Chen, R Fan, **M Bilal**, X Yang, J Wang, W Li (2018). Multilevel Cloud Detection for High-Resolution Remote Sensing Imagery Using Multiple Convolutional Neural Networks, *ISPRS International Journal of Geo-Information* 7 (5),
15. Y Mao, S Wang, Z Qiu, D Sun, **M Bilal** (2018) Variations of transparency derived from GOCI in the Bohai Sea and the Yellow Sea, *Optics Express* 26 (9), 12191-12209.
16. HC Ho, MS Wong, L Yang, TC Chan, and **M Bilal**. (2018). Influences of socioeconomic vulnerability and intra-urban air pollution exposure on short-term mortality during extreme dust events. *Environmental Pollution*, 235, 155-162, doi: 10.1016/j.envpol.2017.12.047.
17. Shen, X., **Bilal, M.**, Qiu, Z., Sun, D., Want, S., and Zhu, W. (2018). Validation of MODIS C6 Dark Target Aerosol Products at 3 km and 10 km Spatial Resolutions Over the China Seas and the Eastern Indian Ocean. *Remote Sensing*, doi: 10.3390/rs10040573.
18. Nazeer, M. and **Bilal, M.*** (2018). Evaluation of Ordinary Least Square (OLS) and Geographically Weighted Regression (GWR) for water quality monitoring: a case study for the estimation of Salinity. *Journal of Ocean University of China* 17 (2), 305-310.
19. HC Ho, MS Wong, L Yang, W Shi, J Yang, **M Bilal**, and TC Chan. (2018). Spatiotemporal influence of temperature, air quality, and urban environment on cause-specific mortality during hazy days. *Environmental International*, 112, 10-22, doi: 10.1016/j.envint.2017.12.001.
20. **Bilal, M**, Nazeer, M., Qiu, Z., Ding, X., and Wei, J. (2018). Global Validation of MODIS C6 and C6.1 Merged Aerosol Products over Diverse Vegetated Surfaces. *Remote Sensing*, doi: 10.3390/rs10030475.
21. **Bilal, M**, Qiu, Z., Campbell, J.R., Scott, S., Shen, J., and Nazeer, M (2018). A New MODIS C6 Dark Target and Deep Blue Merged Aerosol Product at 3 km Spatial Resolution. *Remote Sensing*, doi: 10.3390/rs10030463.
22. J Wei, B Huang, **M Bilal**, Z Zhang, and L Wang. (2018). Verification, improvement and application of aerosol optical depths in China part 1: Inter-comparison of NPP-VIIRS and Aqua-MODIS. *Atmospheric Environment*, doi: 10.1016/j.atmosenv.2017.11.048.
23. L He, L Wang, A Lin, M Zhang, **M Bilal**, and J Wei. (2018). Performance of the NPP-VIIRS and Aqua-MODIS Aerosol Optical Depth Products over the Yangtze River Basin. *Remote Sensing*, doi: 10.3390/rs10010117.
24. M Zhang, L Wang, M Bilal, W Gong, Z Zhang, G Guo (2018). The Characteristics of the Aerosol Optical Depth within the Lowest Aerosol Layer over the Tibetan Plateau from 2007 to 2014, *Remote Sensing* 10 (5), 696.
25. **Bilal, M.***, Nichol, J.E., and Wang. L. (2017). New customized methods for improvement of the MODIS C6 Dark Target and Deep Blue merged aerosol product. *Remote Sensing of Environment*, 197, 115-124. DOI: 10.1016/j.rse.2017.05.028.
26. **Bilal, M.***, and Nichol, J.E. (2017). Evaluation of the NDVI-based pixel selection criteria of the MODIS C6 Dark Target and Deep Blue combined aerosol product. *IEEE JSTARS*, DOI: 10.1109/JSTARS.2017.2693289.
27. **Bilal, M.***, Nazeer, M., and Nichol, J.E. (2017). Validation of MODIS and VIIRS derived aerosol optical depth over complex coastal waters. *Atmospheric Research*, 186, 43-50. doi: 10.1016/j.atmosres.2016.11.009
28. **Bilal, M.**, Nichol, J.E. and Scott, N.S. (2017). A New Approach for Estimation of Fine Particulate Concentrations Using Satellite Aerosol Optical Depth and Binning of Meteorological Variables, *Aerosol and Air Quality Research*, 17, 356–367, doi: 10.4209/aaqr.2016.03.0097
29. M Nazeer, A Waqas, **M Bilal**, MI Shahzad, MMM Alsahli. (2017). Evaluation of Empirical and Machine Learning Algorithms for Estimation of Coastal Water Quality Parameters. *ISPRS International Journal of Geo-Information*, 6(11), 360, doi:10.3390/ijgi6110360.

30. L He, L Wang, A Lin, M Zhang, **M Bilal**, M Tao. (2017). Aerosol Optical Properties and Associated Direct Radiative Forcing over the Yangtze River Basin during 2001–2015. *Remote Sensing*, 9 (7), 746.
31. J Wei, B Huang, L Sun, Z Zhang, L Wang, **M Bilal**. (2017). A simple and universal aerosol retrieval algorithm for Landsat series images over complex surfaces. *Journal of Geophysical Research: Atmospheres*, doi: 10.1002/2017JD026922.
32. Wang, L., Kisi., O., Hu, B., **Bilal, M.**, Kermani., M.Z., and Li, Hu. (2017). Evaporation modeling using different machine learning techniques. *International Journal of Climatology*, DOI: 10.1002/joc.5064.
33. **Bilal, M.**,* Nichol, J.E. and Nazeer, M. (2016). Validation of Aqua–MODIS C051 and C006 Operational Aerosol Products Using AERONET Measurements Over Pakistan, *IEEE JSTARS*, 9(5), 2074–2080, doi: 10.1109/JSTARS.2015.2481460.
34. Nichol, J.E. and **Bilal, M.** (2016). Validation of MODIS 3 km Resolution Aerosol Optical Depth Retrievals over Asia, *Remote Sensing*, 8(4), 328, doi: 10.3390/rs8040328.
35. Gong, J., Hu, Y., Liu, M., Bu, R., Chang, Y., **Bilal, M.**, Li, C., Wu, W., Ren, B. (2016). Land Use Regression Models Using Satellite Aerosol Optical Depth Observations and 3D Building Data from the Central Cities of Liaoning Province, China. *Polish J. Environ. Stud.*
36. Bin, Z., Qiang, P., **Bilal, M.**, Qihao, W., Liang, Z., and Nichol, J. (2016). High-resolution Satellite Mapping of Fine Particulates Based on Geographically Weighted Regression, *IEEE Geoscience and Remote Sensing Letters*, 13(4), 495–499. (IF ~ 2.761)
37. **Bilal, M.**, and Nichol, J.E. (2015). Evaluation of MODIS aerosol retrieval algorithms over the Beijing–Tianjin–Hebei region during low to very high pollution events, *Journal of Geophysical Research-Atmosphere*, 120, 7941–7957, doi: 10.1002/2015JD023082.
38. Sun, L., Wei, J., **Bilal, M.**, Tian, X. Jia, C., Guo, Y., and Mi, X. (2015). Aerosol Optical Depth Retrieval over Bright Areas using Landsat 8 OLI Images, *Remote Sensing*, 8(1), 23.
39. **Bilal, M.**, Nichol, J.E., and Chan, P.W. (2014). Validation and accuracy assessment of a Simplified Aerosol Retrieval Algorithm (SARA) over Beijing under low and high aerosol loadings and dust storms, *Remote Sensing of Environment*, 153, 50–60, doi: 10.1016/j.rse.2014.07.015.
40. **Bilal, M.**, Nichol, J.E., Bleiweiss, M.P., Dubois, D.W. (2013). A Simplified high resolution MODIS Aerosol Retrieval Algorithm (SARA) for use over mixed surfaces, *Remote Sensing of Environment*, 136, 135–145, doi: 10.1016/j.rse.2013.04.014.
41. Butt, M.J., and **Bilal, M.** (2011). Application of snowmelt runoff model for water resource management, *Hydrological Processes*, 25, 3735–3747.

Conference Proceedings

1. **Bilal, M.** and Qiu, Z (2018). Aerosol Retrievals over Bright Urban Surfaces Using Landsat 8 Images, *IEEE IGARSS*, Valencia 22–27 July 2018.
2. **Bilal, M.** and Qiu, Z (2018). Evaluation of Modis C6 Combined Aerosol Product at Global Scale. *IEEE IGARSS*, Valencia 22–27 July 2018.
3. **Bilal, M.**, Nichol, J.E., and Bleiweiss, M.P. (2014). Development and Validation of MODIS High-Resolution Simplified Aerosol retrieval algorithm (SARA). *International Conference on Space*, Islamabad, Pakistan, 12–14 November 2014.
4. **Bilal, M.**, Nichol, J.E., and Bleiweiss, M.P. (2014). Development and Validation of MODIS High-Resolution Simplified Aerosol retrieval algorithm (SARA). *International Conference on Space*, Islamabad, Pakistan, 12–14 November 2014.
5. Nichol, J., and **Bilal, M.** (2014). Validation of a Simplified Aerosol retrieval Algorithm (SARA) over Beijing, *The 35th Asian Conference on Remote Sensing*, Nay Pyl Taw, 27–31 October 2014.
6. Nichol, J., **Bilal, M.**, and Ashley, W.W.S. (2014). Retrieval of Aerosol Optical Thickness (AOT) from urban Shadows using fine resolution WorldView-II images, *Remote Sensing and Photogrammetry Society Annual Conference*, Aberystwyth, 02–05 September 2014.
7. **Bilal, M.**, Nichol, J.E., Bleiweiss, M.P., and Dubois, D. (2012). Retrieving MODIS Aerosol Optical Depth in real time at 500 m resolution: urban-scale evaluation over Hong Kong, *European Aerosol Conference (EAC)*, Granada, Spain, 02–07 September.
8. **Bilal, M.** Bleiweiss, M.P., Nichol, J.E., and Dubois, D. (2011). MODIS Satellite Sensor Products Used for Snowmelt Runoff Modelling in Support of Water Resource Management, *ISNET/RJGC workshop on Application of Satellite Technology in Water Resources Management*, Amman, Jordan, 18–22 September.
9. Wong M. S., Nichol J. E., **Bilal M.** and Shahzad M. I. (2011), Validation of MODIS, MISR, and OMI Aerosol Optical Thickness using ground-based Sunphotometers in Hong Kong, *The Asia Oceania Geosciences Society – Remote Sensing Symposium*, Taipei, Taiwan, 08–12 August.

Serving as a reviewer

- * Serving as a reviewer for more than 30 SCI/SCIE journals and has provided more than 125 reviews.

Interdisciplinary Activities and Outreach

- * **Visiting Research Scholar (VRS)** New Mexico State University (NMSU), New Mexico State–USA (**SEP 2011–JAN 2012**)
- * **Visiting Research Scholar (VRS)** Center for Global and Regional Environmental Research, University of Iowa (UI), Iowa City, Iowa State–USA (**FEB 2012**)

Professional Training & Workshops

1. **Title:** ITARS Summer School on Aerosol Remote Sensing, Processes and Applications (**23 SEP–04 OCT 2013**)

- (Venue: Bucharest, Romania)
2. **Title:** Advance training course on Ocean Remote Sensing **(21–26 OCT 2013)**
(Venue: Chinese University of Hong Kong (CUHK))
 3. **Title:** ISNET/RJGC Workshop on Application of Space Technology for Food Security **(09–14 JUL 2012)**
(Venue: Cheikh Anta DIOP University and Centre de Suivi Ecologique (CSE), Dakar–Senegal)
 4. **Title:** Basics of Weather Research & Forecasting (WRF) Model **(21–28 JAN 2012)**
(Venue: National Center for Atmospheric Research (NCAR), USA)
 5. **Title:** ISNET/CSE Workshop on Application of Satellite Technology in Water Resource Management
(Venue: Royal Jordanian Geographic Centre (RJGC), Amman–Jordan. **(18–22 SEP 2011)**)
 6. **Title:** Faculty Development Program – Analysis of Research Data Using SPSS **(23–25 APR 2009)**
(Venue: CIIT Library, Islamabad, Pakistan)

Conducted Training Courses

- * **Course Name:** MODIS Data Processing **(12–13 FEB 2014)**
(Venue: Remote Sensing and GIS Lab, Department of Space Science, University of the Punjab, Lahore, Pakistan)

Professional Society Membership

- * Hong Kong Society of Remote Sensing (HKSRS)