Subhadip Dey

Curriculum Vitae

Personal Data

Name	Subhadip Dey
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Affiliation

Assistant Professor
Indian Institute of Technology Kharagpur
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Education

2018–2022 **Ph. D. in Geoinformatics and Natural Resources Engineering**, GPA: 9.57/10.0, Indian Institute of Technology Bombay, Mumbai, India.

- **Thesis:** "*Development of Target Scattering Descriptors for Crop Characterization Using SAR Data*,"
  Supervisor: **Prof. Avik Bhattacharya**

2016–2018 **M.Tech. in Aquacultural Engineering**, GPA: 9.61/10.0, Indian Institute of Technology Kharagpur, West Bengal, India.

- **Thesis:** "*Augmented Logarithmic Gaussian Process Regression Methodology for Chlorophyll Prediction*,"
  Supervisor: **Prof. C. K. Mukherjee**

2012–2016 **B.Tech. in Agricultural Engineering**, GPA: 8.40/10.0, Bidhan Chandra Krishi Viswavidyalaya, West Bengal, India.

- **Thesis:** "*Design and Layout of Drip Irrigation System through Optimization for Saving of Water and Energy to Cultivate Commercial Horticultural Crops (Guava) Using Simulation Method*,"
  Supervisor: **Prof. P. K. Dhara**

Research Interests

✓ **Aquacultural structure monitoring using optical and SAR data**
✓ **Crop type classification and mapping using optical and SAR data**
✓ **Crop biophysical parameter estimation**
✓ **Surface soil moisture retrieval and wetland monitoring**
✓ **SAR Polarimetry, Scattering models, Polarimetric decomposition**
✓ **Agricultural Engineering, Aquacultural Engineering**
✓ **SAR Image Statistics and Scattering Physics**

Publications

Book Chapters

1. **S. Dey**, L. Mascolo, A. Bhattacharya, J.M. Lopez-Sanchez, "Polarimetric SAR Descriptors for Rice Monitoring", in *Spaceborne Synthetic Aperture Radar Remote Sensing: Techniques and Applications* (1st ed.), CRC Press, 2023, DOI: https://doi.org/10.1201/9781003204466

Peer Reviewed Journals

1. A. Verma, A. Bhattacharya, **S. Dey**, C. López-Martínez, P. Gamba, "Built-up Area Mapping Using Sentinel-1 SAR Data," *ISPRS Journal of Photogrammetry and Remote Sensing*, 2023.

2. V. Lavanya, A. Nayak, S. Dasgupta, S. Urkude, **S. Dey**, A. Biswas, B. Li, D. C. Weindorf, S. Chakraborty, "A smartphone-integrated imaging device for measuring nitrate and phosphate in soil and water samples", *Microchemical Journal*, 193: 109042, 2023, DOI: https://doi.org/10.1016/j.microc.2023.109042

3. N. Bhogapurapu, **S. Dey**, A. Bhattacharya, C. López-Martínez, I. Hajnsek and Y. S. Rao, "Soil Permittivity Estimation Over Croplands Using Full and Compact Polarimetric SAR Data", *IEEE Transactions on Geoscience and Remote Sensing*, vol. 60, pp. 1-17, 2022. Art no. 4415917, DOI: https://doi.org/10.1109/TGRS.2022.3224280

4. A. Bhattacharya, **S. Dey**, A. C. Frery and J. J. Gil, "Dual views of the generalized degree of purity," *JOSA A*, vol. 39, pp. 2339-2342, 12(2022). DOI: https://doi.org/10.1364/JOSAA.476423

5. **S. Dey**, N. Romero-Puig and A. Bhattacharya, "Polarimetric Scattering Spectrum Analysis for Target Characterization," *IEEE Geoscience and Remote Sensing Letters*, vol. 19, pp. 1-5, 2022, Art No. 4027005. DOI: https://doi.org/10.1109/LGRS.2022.3206466.

6. N. Bhogapurapu, **S. Dey**, S. Homayouni, A. Bhattacharya and Y. S. Rao "Field-scale soil moisture estimation using sentinel-1 GRD SAR data" in *Advances in Space Researchg*, 2022. DOI: https://doi.org/10.1016/j.asr.2022.03.019

7. S. Ghosh, **S. Dey**, N. Bhogapurapu, S. Homayouni, A. Bhattacharya and H. McNairn "Gaussian Process Regression Model for Crop Biophysical Parameter Retrieval from Multi-Polarized C-Band SAR Data" in *Remote Sensing*, 2022. DOI: https://doi.org/10.3390/rs14040934

8. N. Bhogapurapu, **S. Dey**, D. Mandal, A. Bhattacharya, L. Karthikeyan, H. McNairn and Y. S. Rao "Soil Moisture Retrieval Over Croplands Using Dual-Pol L-band GRD SAR Data," *Remote Sensing of Environment*, 271: 112900, 2022, DOI: https://doi.org/10.1016/j.rse.2022.112900.

9. A. Bhattacharya, **S. Dey**, A. C. Frery, "Scattering Purity and Complexity in Radar Polarimetry", *IEEE Transactions on Geoscience and Remote Sensing*, vol. 60, pp. 1-14, 2022. Art no. 5222514, DOI: https://doi.org/10.1109/TGRS.2022.3141790

10. **S. Dey**, N. Bhogapurapu, S. Homayouni, A. Bhattacharya and H. McNairn. "Unsupervised Classification of Crop Growth Stages with Scattering Parameters from Dual-Pol Sentinel-1 SAR Data" in *Remote Sensing*, vol. 13, no. 21, pp. 4412, 2021. DOI: https://doi.org/10.3390/rs13214412

11. **S. Dey**, U. Chaudhuri, D. Mandal, A. Bhattacharya, B. Banerjee, H. McNairn, "BiophyNet: A Regression Network for Joint Estimation of Crop Biophysical Parameters from SAR Data," *IEEE Geoscience and Remote Sensing Letters*, vol. 18, no. 10, pp. 1701-1705, Oct. 2021. DOI: https://doi.org/10.1109/LGRS.2020.3008757.

12. **S. Dey**, U. Chaudhuri, N. Bhogapurapu, J. M. Lopez-Sanchez, B. Banerjee, A. Bhattacharya, D. Mandal and Y. S. Rao, "Synergistic Use of TanDEM-X and Landsat-8 Data for Crop-type Classification and Monitoring," in *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, vol. 14, pp. 8744-8760, 2021, DOI: https://doi.org/10.1109/JSTARS.2021.3103911.

13. U. Chaudhuri, **S. Dey**, M. Datcu, B. Banerjee, A. Bhattacharya, "Inter-band Retrieval and Classification Using the Multi-labeled Sentinel-2 BigEarthNet Archive," in *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, vol. 14, pp. 9884-9898, 2021, DOI: https://doi.org/10.1109/JSTARS.2021.3112209.

14. **S. Dey**, A. Bhattacharya, A. C. Frery, C. López-Martínez and Y. S. Rao, "A Model-free Four Component Scattering Power Decomposition for Polarimetric SAR Data," in *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, vol. 14, pp. 3887-3902, 2021, DOI: https://doi.org/10.1109/JSTARS.2021.3069299.

15. N. Bhogapurapu, **S. Dey**, A. Bhattacharya, D. Mandal, J. M. Lopez-Sanchez, H. McNairn, Carlos López-Martínez, Y. S. Rao, "Dual-polarimetric descriptors from Sentinel-1 GRD SAR data for crop growth assessment," *ISPRS Journal of Photogrammetry and Remote Sensing*, 178, pp. 20-35, 2021. DOI: https://doi.org/10.1016/j.isprsjprs.2021.05.013

16. N. Bhogapurapu, **S. Dey**, D. Mandal, A. Bhattacharya, and Y. S. Rao, "PolSAR tools: A QGIS plugin for generating SAR descriptors," *Journal of Open Source Software*, 6(60), 2970, 2021, DOI: https://doi.org/10.21105/joss.02970

17. **S. Dey**, N. Bhogapurapu, A. Bhattacharya, D. Mandal, J. M. Lopez-Sanchez, H. McNairn, A. C. Frery, "Rice Phenology Mapping Using Novel Target Characterization Parameters from Polarimetric SAR Data," *International Journal of Remote Sensing*, 42 (14), pp. 5519-5543, 2021; DOI: https://doi.org/10.1080/01431161.2021.1921876.

18. **S. Dey**, A. Bhattacharya, D. Ratha, D. Mandal, A. C. Frery, "Target Characterization and Scattering Power Decomposition for Full and Compact Polarimetric SAR Data", *IEEE Transactions on Geoscience and Remote Sensing*, vol. 59, no. 5, pp. 3981-3998, May 2021. DOI: https://doi.org/10.1109/TGRS.2020.3010840.

19. **S. Dey**, A. Bhattacharya, D. Ratha, D. Mandal, H. McNairn, J. M. Lopez-Sanchez, Y. S. Rao, "Novel clustering schemes for full and compact polarimetric SAR data: An application for rice phenology characterization," *ISPRS Journal of Photogrammetry and Remote Sensing*, 169, pp. 135-151, 2020, DOI: https://doi.org/10.1016/j.isprsjprs.2020.09.010.

20. D. Mandal, V. Kumar, D. Ratha, **S. Dey**, A. Bhattacharya, J. M. Lopez-Sanchez, H. McNairn, Y. S. Rao, "Dual Polarimetric Radar Vegetation Index for Crop Growth Monitoring Using Sentinel-1 SAR Data," *Remote Sensing of Environment*, 247: 111954, 2020, DOI: https://doi.org/10.1016/j.rse.2020.111954.

21. **S. Dey**, D. Mandal, L. D. Robertson, B. Banerjee, V. Kumar, H. McNairn, A. Bhattacharya, and Y. S. Rao "In-Season Crop Classification Using Elements of the Kennaugh Matrix Derived from Polarimetric RADARSAT-2 SAR Data," *International Journal of Applied Earth Observations and Geoinformation*, 88: 102059, 2020, DOI: https://doi.org/10.1016/j.jag.2020.102059.

22. **S. Dey**, S. Pratiher, C. K. Mukherjee, S. Banerjee, "SolarisNet : A deep regression network for solar radiation prediction," *Mausam*, 71 (03), pp. 443-450, 2020; https://metnet.imd.gov.in/imdmausam/.

Conference Proceedings and Workshops

1. **S. Dey**, N. Romero-Puig, A. Bhattacharya, A. Marino, 2023. "Target description using the full-polarimetric scattering spectrum", *IEEE International Geoscience and Remote Sensing Symposium-IGARSS 2023*

2. H. Maurya, A. Bhattacharya, R. K. Panigrahi, **S. Dey**, 2023. "Eigenvalue-eigenvector based hybrid decomposition of polarimetric SAR data", *IEEE International Geoscience and Remote Sensing Symposium-IGARSS 2023*

3. A. Paul, **S. Dey**, G. D. Bhowmick, A. Bhattacharya, 2023. "A novel technique to characterize the scattering phenomenon from raft and its detection", *IEEE International Geoscience and Remote Sensing Symposium-IGARSS 2023*

4. N. Bhogapurapu, **S. Dey**, A. Bhattacharya, U. Khati, Y. S. Rao, 2023. "Global Sentinel-1 GRD descriptors over various forest types", *IEEE International Geoscience and Remote Sensing Symposium-IGARSS 2023*

5. A. Bhattacharya, A. Verma, **S. Dey**, 2023, June. Coherent Target Characterization in Radar Polarimetry. In *POLINSAR 2023, Workshop on Applications of SAR Polarimetry and Polarimetric Interferometry, ESA-ESRIN*

6. **S. Dey**, A. Richardson, A. Bhattacharya, 2023, June. Burned Area Mapping Using Scattering Spectrum Information from Full Polarimetric ALOS-2 SAR Data. In *POLINSAR 2023, Workshop on Applications of SAR Polarimetry and Polarimetric Interferometry, ESA-ESRIN*

7. **S. Dey**, N. Bhogapurapu, A. Bhattacharya, 2022. "Ground and Volume Scattering Separation in Compact Polarimentric Interferometric SAR Data", pp. 1-4, *2022 URSI Regional Conference on Radio Science (USRI-RCRS)* DOI: https://doi.org/10.23919/URSI-RCRS56822.2022.10118450

8. **S. Dey**, A. Bhattacharya, 2022. "Revisiting the Dual Polarization Alpha Using the Deschamps Parameter", pp. 72-75, *IEEE International Geoscience and Remote Sensing Symposium-IGARSS 2022* DOI: https://doi.org/10.1109/IGARSS46834.2022.9883445

9. A. Bhattacharya, **S. Dey**, A. C. Frery, 2022. "The Essence of Scattering Purity and Complexity in Radar Polarimetry", pp. 5353-5356, *IEEE International Geoscience and Remote Sensing Symposium-IGARSS 2022* DOI: https://doi.org/10.1109/IGARSS46834.2022.9883569

10. N. Bhogapurapu, **S. Dey**, A. Bhattacharya, C. López-Martínez, I. Hajnsek, Y. S. Rao, 2022. "Soil permittivity estimation over croplands using PolSAR data", pp. 8000-8003, *IEEE International Geoscience and Remote Sensing Symposium-IGARSS 2022* DOI: https://doi.org/10.1109/IGARSS46834.2022.9883708 (**Best student paper award to N. Bhogapurapu**)

11. A. Verma, **S. Dey**, C. López-Martínez, A. Bhattacharya, P. Gamba, 2022. "Dual-Pol Radar Built-Up Area Index for Urban Area Mapping Using Sentinel-1 SAR Data", pp. 5282-5285, *IEEE International Geoscience and Remote Sensing Symposium-IGARSS 2022* DOI: https://doi.org/10.1109/IGARSS46834.2022.9884276

12. **S. Dey**, C. López-Martínez, A. Bhattacharya, A. C. Frery, "A PolSAR Clustering Scheme Using the Model-free Scattering Power Components", *EUSAR* 2022

13. N. Bhogapurapu, **S. Dey**, S. Homayouni, A. Bhattacharya and Y. S. Rao, "Scattering Parameters from Sentinel-1 SAR Data for crop growth assessment", pp. 58-61, *IEEE Mediterranean and Middle-East Geoscience and Remote Sensing Symposium* (M2GARSS), 2022 DOI: https://doi.org/10.1109/M2GARSS52314.2022.9840171

14. S. S. Ghosh, **S. Dey**, N. Bhogapurapu, S. Homayouni, A. Bhattacharya and H. McNairn, "Crop biophysical parameter retrieval using Gaussian process regression from C-band polarimetric SAR data", pp. 181-184, *IEEE Mediterranean and Middle-East Geoscience and Remote*

Sensing Symposium (M2GARSS), 2022 DOI: https://doi.org/10.1109/M2GARSS52314.2022.9839744

15. A. Verma, **S. Dey** and A. Bhattacharya, "Land Cover Classification Using Dual-Polarimetric SAR Data", pp. 54-57, *IEEE Mediterranean and Middle-East Geoscience and Remote Sensing Symposium* (M2GARSS), 2022 DOI: https://doi.org/10.1109/M2GARSS52314.2022.9840299

16. **S. Dey**, N. Bhogapurapu, A. Verma, S. Homayouni, C. López-Martínez, and A. Bhattacharya, "Simultaneous evaluation of the target scattering-type parameter and scattering power components from polarimetric SAR images," pp. 537-540, *IEEE India Geoscience and Remote Sensing Symposium (InGARSS)*, Ahmedabad, India, 2021 DOI: https://doi.org/10.1109/InGARSS51564.2021.9791986

17. A. Verma, **S. Dey**, N. Bhogapurapu, C. López-Martínezez, and A. Bhattacharya, "Dual polarimetric SAR signature for human-made target characterization," pp. 520-523, *IEEE India Geoscience and Remote Sensing Symposium (InGARSS)*, Ahmedabad, India, 2021 DOI: https://doi.org/10.1109/InGARSS51564.2021.9792130

18. N. Bhogapurapu, **S. Dey**, A. Verma, A. Bhattacharya, C. López-Martínezez, P. Pankajakshan, and Y. S. Rao, "Crop growth assessment using Sentinel-1 GRD SAR descriptors," pp. 545-548, *IEEE India Geoscience and Remote Sensing Symposium (InGARSS)*, Ahmedabad, India, 2021 DOI: https://doi.org/10.1109/InGARSS51564.2021.9791910

19. **S. Dey**, N. Bhogapurapu, A. Bhattacharya, D. Mandal, H. McNairn and Y. S. Rao 2021 "Novel Clustering Technique for Monitoring Crop Phenology", APSAR 2021: The 7th Asia-Pacific Conference on Synthetic Aperture Radar.

20. N. Bhogapurapu, **S. Dey**, A. Bhattacharya, and Y. S. Rao 2021 "Soil Moisture Estimation Using Simulated NISAR Dual Polarimetric GRD Product over Croplands", APSAR 2021: The 7th Asia-Pacific Conference on Synthetic Aperture Radar.

21. **S. Dey**, N. Bhogapurapu, A. Bhattacharya, A. C. Frery, P. Gamba, 2021. "Built-up Area Mapping Using Full and Dual Polarimetric SAR Data", pp. 1693-1696, *IEEE International Geoscience and Remote Sensing Symposium-IGARSS 2021* DOI: https://doi.org/10.1109/IGARSS47720.2021.9553040

22. **S. Dey**, A. Bhattacharya, A. C. Frery, C. Lopez-Martınez, 2021. "Target Scattering Characterization in SAR Polarimetry Using Model-free Approaches", pp. 323-326, *IEEE International Geoscience and Remote Sensing Symposium-IGARSS 2021* DOI: https://doi.org/10.1109/IGARSS47720.2021.9553581

23. N. Bhogapurapu, **S. Dey**, D. Mandal, A. Bhattacharya, Y. S. Rao, 2021. "Monitoring Wheat Crop Growth Using a New Vegetation Index from Sentinel-1 GRD SAR Data", pp. 5921-5924, *IEEE International Geoscience and Remote Sensing Symposium-IGARSS 2021* DOI: https://doi.org/10.1109/IGARSS47720.2021.9554351

24. A. Verma, **S. Dey**, N. Bhogapurapu, D. Mandal, D. Haldar, A. Bhattacharya, 2021. "Polari-

metric SAR Signature for Crop Characterization", pp. 503-506, *IEEE International Geoscience and Remote Sensing Symposium-IGARSS 2021* DOI: https://doi.org/10.1109/IGARSS47720.2021.9553979

25. **S. Dey**, N. Bhogapurapu, A. Bhattacharya, Y. S. Rao, 2021, April. Crop Monitoring Using Sentinel-1 GRD Product in GEE Platform. In *POLINSAR 2021, Workshop on Applications of SAR Polarimetry and Polarimetric Interferometry, ESA-ESRIN*

26. N. Bhogapurapu, **S. Dey**, A. Bhattacharya, Y. S. Rao, 2021, April. Soil moisture estimation over canola crop using Simulated NISAR Dual Polarimetric GRD Product. In *POLINSAR 2021, Workshop on Applications of SAR Polarimetry and Polarimetric Interferometry, ESA-ESRIN*

27. **S. Dey**, D. Ratha, D. Mandal, A. Bhattacharya, A. C. Frery, 2020. "A Non-model Based Three Component Scattering Power Decomposition for Full Polarimetric SAR Data", 2020 *IEEE International Geoscience and Remote Sensing Symposium-IGARSS 2020*, Hawaii, USA. pp. 7021-7024, DOI: https://doi.org/10.1109/IGARSS39084.2020.9323495 (**Finalist in the best student paper award**)

28. D. Mandal, N. R. Bhogapurapu, V. Kumar, **S. Dey**, D. Ratha, A. Bhattacharya, J. M. Lopez Sanchez, H. McNairn and Y. S. Rao, "Vegetation monitoring using a new dual-pol radar vegetation index: A preliminary study with simulated NASA-ISRO SAR (NISAR) L-band data," 2020 *IEEE International Geoscience and Remote Sensing Symposium-IGARSS 2020*, Hawaii, USA, pp. 4870-4873, DOI: https://doi.org/10.1109/IGARSS39084.2020.9324157

29. D. Ratha, D. Mandal, **S. Dey**, A. Bhattacharya, A. C. Frery, Y. S. Rao, H. McNairn, "New Vegetation Indices For Full And Compact Polarimetric Sar Data: In Preparation For The Radarsat Constellation Mission (RCM)," in *2020 IEEE Latin American GRSS & ISPRS Remote Sensing Conference (LAGIRS)*, Santiago, Chile, 2020, pp. 465-470, DOI: https://doi.org/10.1109/LAGIRS48042.2020.9165685.

30. **S. Dey**, D. Mandal, V. Kumar, B. Banerjee, J. M. Lopez Sanchez, H. McNairn, A. Bhattacharya, "Crop Phenology Classification Using A Representation Learning Network From Sentinel-1 SAR Data," 2019 *IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*, Yokohama, Japan, 2019, pp. 7184-7187, DOI: https://doi.org/10.1109/IGARSS.2019.8900389.

31. D. Mandal, A. Bhattacharya, V. Kumar, D. Ratha, **S. Dey**, H. McNairn and A. C. Frery, Y. S. Rao, "A Novel Radar Vegetation Index for Compact Polarimetric SAR data," 2019 *IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*, Yokohama, Japan, 2019, pp. 1037-1040, DOI: https://doi.org/10.1109/IGARSS.2019.8898022.

32. **S. Dey**, S. Pratiher, C. K. Mukherjee, S. Banerjee, A. Chakraborty, "Augmented logarithmic Gaussian process regression methodology for chlorophyll prediction," Proc. SPIE 10679, *Optics, Photonics, and Digital Technologies for Imaging Applications V*, 106791E, DOI: https://doi.org/10.1117/12.2306266.

33. S. Pratiher, S. Mukhopadhyay, R. Barman, S. Pratiher, **S. Dey**, S. Banerjee, P. K. Panigrahi, "Recurrence Quantification & ARIMA based Forecasting of Rainfall-Temperature Dynamics," 2016 *International Conference on Signal Processing and Communication (ICSC)*, Noida, 2016, pp. 490-495, DOI: https://doi.org/10.1109/ICSPCom.2016.7980630.

34. S. Mukhopadhyay, S. Mandal, N. K. Das, **S. Dey**, A. Mitra, N. Ghosh, P. K. Panigrahi, "Diagnosing Heterogeneous Dynamics for CT Scan Images of Human Brain in Wavelet and MFDFA Domain," *Advances in Optical Science and Engineering*. Springer Proceedings in Physics, 166. Springer, New Delhi. DOI: https://doi.org/10.1007/978-81-322-2367-2_42.

35. S. Mukhopadhyay, R. Barman, **S. Dey**, A. Mitra, P. K. Panigrahi, P. Bhattacharya, K. K. Dhar, "Diagnosing heterogeneous dynamics for wind particle trajectory in wavelet domain," *Proceedings of the 2015 Third International Conference on Computer, Communication, Control and Information Technology (C3IT)*, Hooghly, 2015, pp. 1-3, DOI: https://doi.org/10.1109/C3IT.2015.7060135.

36. **S. Dey**, V. Kumar, and Y. S. Rao, "Time Series Analysis of Quad-Pol RADARSAT-2 and Sentinel-2 Data for Different Crops,". *National Symposium, Indian Society of Remote Sensing and Indian Society of Geomatics ISRS* 2019, Meghalaya, India, 2019.

Product Development

2021 **Development of decomposition parameters plugins in "Polarimetric Decomposition" and "Compact Polarimetry" modules**, https://step.esa.int/main/download/snap-download/.

2020 **SAR tools, a QGIS Plugin**, https://plugins.qgis.org/plugins/sar_tools/.

2020 **Python package for Model Free Polarimetric Decomposition**, *Python packages under pip repository for model free polarimetric decomposition*, https://pypi.org/project/mf3cf/ and, https://pypi.org/project/mf3cc/.

2020 **Radar Vegetation Index Code for Dual Polarimetric**, *EO-browser Custom script contest shortlisted 2019*, https://custom-scripts.sentinel-hub.com/custom-scripts/sentinel-1/radar_vegetation_index_code_dual_polarimetric/.

2020 **Model-free Polarimetric decompositions (MF3CF, MF3CC, MF3CD)**, *A MATLAB based standalone tool for generating model free decomposition parameters from full, compact and dual co-polarimetric SAR Data.*

2015 **An informative agricultural crop related software**, *A visual basic based software tool for retrieving information about different management practices for major crops in India.*

2015 **Python based software for multiclass classification in cancer diagnosis**, *A collaborative project with Indian Institute of Science Education and Research, Kolkata*, https://www.linkedin.com/in/subhadip-dey-278879b4/.

Experiences

2022– 2022 **Postdoctoral researcher**, Deutsches Zentrum für Luft- und Raumfahrt (German Aerospace Center DLR), Germany.

- Polarimetric SAR interferometry

2018–2021 **Research scholar**, Indian Institute of Technology Bombay, Microwave Remote Sensing Lab, India.

- SAR polarimetry and agriculture application
- Model free scattering power decomposition for full, dual co and compact polarimetric SAR data
- Crop type classification and bio-physical parameter estimation

2018–2021 **Teaching Assistant**, Indian Institute of Technology Bombay, India.

Course involvement:

- GNR647: Microwave Remote Sensing
- GNR805: Advanced Concepts in Polarimetric SAR Image Analysis
- GNR652: Machine Learning in Remote Sensing
- GNR792: Communications Skills
- GNR653: Data Analysis Methods for Geospatial Applications
- GNR401: Remote Sensing and Image Processing

Prepared Radar training presentations and notes

2015–2015 **Trainee**, Summer In-Plant Training, Central Soil & Water Conservation Research & Training Institute.

- Soil and water conservation

2014–2014 **Trainee**, Summer In-Plant Training, Southern Region Farm Machinery Training and Testing Institute.

- Farm Machinery and Power

Technical Skills

✓ **Programming Skill**, C++ | MATLAB | Python | Visual Basic | R | JS | Embedded C | Arduino | ENVI IDL

✓ **Software and Tools**, ArcGIS | QGIS | ERDAS Imagine | ENVI | PolSARPro | SNAP | Earth Engine | ATMEL Studio | Proteus

✓ **Microcontroller and development boards**, ATMEGA | Arduino | Raspberry Pi

✓ **Python packages**, GDAL | Rasterio | Geopandas | Pandas | PYRAT | Tensorflow | Keras

✓ **Online data analysis**, Google Earth Engine | Google Colaboratory | Amazon Web Service | Sagemaker | S3 bucket | Amazon EC2 instances | EFS system

Github: https://github.com/Subho07?tab=repositories

Research Projects/ Third Party Funding Acquired

✓ **Project title:** "BC Wildfire Service – Predictive Services Unit – Fuel Type Layer Project".

- **Funding agency:** Province of British Columbia
- **Role in project:** Co-principal investigator

✓ **Project title:** "Azure4GEO - Deep learning based crop characterization with synergistic use of SAR and optical data on cloud computing platform".

- **Funding agency:** GEO-Microsoft Planetary Computer Programme
- **Acquired funding:** $ 60000 Cash grant + $ 57,830 Azure grant
- **Project duration:** FEB/2022-FEB/2023
- **Role in project:** Co-Principal Investigator
- **Remarks:** This research grant was through the GEO-Microsoft Planetary Computer Programme

✓ **Project title:** "AWS4AgriSAR: Crop Inventory Mapping from SAR Data on Cloud Computing Platform".

- **Funding agency:** Group on Earth Observations (GEO) and Amazon Web Services (AWS)
- **Acquired funding:** 66000 €

- **Project duration:** JUN/2019-JUN/2022
- **Role in project:** Co-Principal Investigator
- **Remarks:** This research grant was through the GEO-Amazon Earth Observation Cloud Credits Programme
- **Link:** http://www.earthobservations.org/article.php?id=362

✓ **Project title:** "JECAM SAR Inter-Comparison Experiment: Crop Type Identification & Mapping and crop biophysical parameter retrieval".

- **Funding agency:** GEO Global Agricultural Monitoring (GEOGLAM)/ Joint Experiment for Crop Assessment and Monitoring (JECAM)
- **Project duration:** JUN/2017-JUN/2020
- **Role in project:** Team member
- **Remarks:** JECAM network provided numerous Earth Observation datasets free of charge to the partners through agreement with Canadian Space Agency.
- **Link:** http://jecam.org/experiment/sar-intercomparison/ and, http://jecam.org/studysite/india-vijayawada/

Teaching Experiences

2022 - Autmn **Instructor**, AG60051: Open Channel Hydraulics and Coastal Engineering (Postgraduate).

2022 - Autmn **Instructor**, AG69025: Aquacultural Engineering Lab-1 (Postgraduate).

2020 - Spring **Teaching Assitant**, GNR647: Microwave Remote Sensing (Postgraduate).

2019 - Spring **Teaching Assitant**, GNR401: Remote Sensing and Image Processing (Undergraduate).

2019 - Spring **Teaching Assitant**, GNR652: Machine Learning in Remote Sensing (Postgraduate).

2019 - Spring **Teaching Assitant**, GNR647: Microwave Remote Sensing (Postgraduate).

2019 - Spring **Teaching Assitant**, GNR792: Communications Skills (Postgraduate).

2020 - Autumn **Teaching Assitant**, GNR653: Data Analysis Methods for Geo-Spatial Applications (Postgraduate).

2019 - Autumn **Teaching Assitant**, GNR653: Data Analysis Methods for Geo-Spatial Applications (Postgraduate).

2020 - Autumn **Teaching Assitant**, GNR805: Advanced Concepts in Polarimetric SAR Image Analysis (Postgraduate).

Field Expeditions/ Campaigns

01/06/2019 - 26/12/2019 **Co-lead the Field Campaign with joint collaboration by MRSLab – IIT Bombay, and APSAC, at JECAM Test site in Andhra Pradesh, India. The aim of this campaign was to collect Crop and Soil parameters in synchronous with Satellite (Radarsat-2, TerraSAR-X, ALOS-2, Sentinel-1A, Sentinel-2) overpasses**.

01/06/2018 - 22/12/2018 **Participated the Field Campaign with joint collaboration by MRSLab, IIT Bombay, and APSAC, at JECAM Test site in Andhra Pradesh, India for rice crop monitoring and in-situ data collection in synchronous with Satellite (Radarsat-2, Sentinel-1A, LANDSAT-8, Sentinel-2) overpasses.**.

Awards & Achievements

2022 **Naik and Rastogi Award for Excellence in Ph.D. Research**, *Receipent of Naik and Rastogi Award for best thesis paper in PhD for the year 2020-22*, 25000₹.

2022 **Humboldt Research Fellowship for Postdocs**, *Humboldt Research Fellowship award for Postdocs to conduct research with German Aerospace Center (DLR).*

2022 **DLR-DAAD postodoctoral research fellowship**, *Receipent of DLR-DAAD postdoctoral research fellowship to conduct research with German Aerospace Center (DLR)*, 2400€/month.

2022 **IEEE Geoscience and Remote Sensing Society Travel Grant**, *A travel grant was allocated through a competitive application by IEEE GRSS Society for attending GRSS symposium (IGARSS 2022) in Japan*, 1450$.

2022 **Recipient of "Three minutes Thesis Competition" award (Position: 2^{nd}), organized by IEEE International InGARSS-2021**, *Recipient of "Three minutes Thesis Competition" award (Position: 2^{nd}), organized by IEEE International InGARSS-2021.*

2021 **Recipient of IEEE-Geoscience and Remote Sensing Society (GRSS) Talkathon 2021 award (Position: 1^{st}), organized by IEEE GRSS Kolkata chapter**, *Recipient of IEEE-Geoscience and Remote Sensing Society (GRSS) Talkathon 2021 award (Position: 1st), organized by IEEE GRSS Kolkata chapter.*

2020 **Finalist for best student paper award at IEEE International Geo science and Remote Sensing Symposium IGARSS 2020**, *Finalist for the best student paper during student paper competition at IEEE International Geoscience and Remote Sensing Symposium-IGARSS 2020.*

2019 **Shortlisted as EO-browser Custom script contest 2019**, *Sentinel-hub and the Copernicus EU Earth Observation programme and the European Space Agency organized EO-browser custom script contest for globally scripting hackathon.*

2019 **IEEE Geoscience and Remote Sensing Society Travel Grant**, *A travel grant was allocated through a competitive application by IEEE GRSS Society for attending GRSS symposium (IGARSS 2019) in Japan*, 1135$.

2018 **Financial grant for attending IEEE International Instrumentation and Measurement Technology Conference, 2018**, *Indian Institute of Technology Kharagpur provided full financial assistantship to attend best conference hosted by IEEE International Instrumentation and Measurement Technology Conference in the year of 2018*, Full financial assistantship.

2018 - 2021 **Ph.D. Assistantship**, *This competitive fellowship award is provided by the Ministry of Human Resource Development, Government of India*, Rs. 35000/ mo.

2016 - 2018 **M.Tech Assistantship**, *This competitive fellowship award is provided by the Ministry of Human Resource Development, Government of India*, Rs. 18500/ mo.

2012 - 2013 **Ministry of Human Resource Development, Government of India scholarship**, *Received scholarship from Government of India, Ministry of Human Resource Development Department of Higher Education (Scheme of scholarship for college and university students)*, Rs. 10000/ yr.

Synergistic Activity

Peer Recognition:
Verified Publons account: https://publons.com/researcher/4141622/subhadip-dey/

Journal reviewer:

✓ IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), IEEE
✓ IEEE Transactions on Multimedia, IEEE
✓ IEEE Transactions on Geosciences and Remote Sensing (TGRS), IEEE
✓ IEEE Geoscience and Remote Sensing Letters (GRSL), IEEE
✓ IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing (JSTARS)
✓ IEEE Geoscience and Remote Sensing Magazine, IEEE

- ✓ ISPRS Journal of Photogrammetry and Remote Sensing, Elsevier
- ✓ Computers and Electronics in Agriculture, Elsevier
- ✓ International Journal of Applied Earth Observation and Geoinformation, Elsevier
- ✓ Remote Sensing Applications: Society and Environment, Elsevier
- ✓ International Journal of Remote Sensing, Taylor & Francis
- ✓ Canadian Journal of Remote Sensing, Taylor & Francis
- ✓ Arabian Journal of Geosciences, Springer
- ✓ Advances in Space Research, Elsevier
- ✓ The Journal of Open Source Software

- **Scientific committee member** at IEEE *International Geoscience and Remote Sensing Symposium-IGARSS 2023, IGARSS 2022* (IGARSS 2023, IGARSS 2022)
- **Workshop/tutorial** on the Basics of Microwave Remote Sensing and its Application at Integrated institute for advanced research and information, Kolkata (16 and 17 November, 2021)
- **Scientific committee member** at IEEE/GRSS Mediterranean and Middle-East Geoscience and Remote Sensing Symposium 2022 (M2GARSS 2022)
- **Technical Program Committee member** in GEOProcessing 2021 and GEOProcessing 2022
- **Session manager** in sessions: TU2.R5, WE1.R8, WE2.R13, TH1.R7, FR1.R3, FR2.R2 in IEEE *International Geoscience and Remote Sensing Symposium-IGARSS 2020*, Hawaii, United States of America
- **Session manager** in sessions: WE1.R2, FR2.R1 in *IEEE International India Geoscience and Remote Sensing Symposium 2020*, Gujrat, India
- **Organizing committee member** in the *Asia-Pacific Federation for Information Technology in Agriculture (AFITA), 2018*, Maharashtra, India

Professional membership

- IEEE Geoscience and Remote Sensing Society (S'17)(M'23)
- International Society for Photogrammetry and Remote Sensing (IM'21)
- SPIE—International Society for Optics and Photonics (S'18)
- Indian Society of Remote Sensing (Life Member'21 – L-5618)

Students guided

- **B. Tech**
  - Mr. Ankit Sharma (Agricultural and Food Engineering Department, 19AG10006, 2023)
  - Mr. Dale Rajhans Narayan (Agricultural and Food Engineering Department, 19AG10010, 2023)
- **M. Tech**
  - Mr. Avrodeep Paul (Agricultural and Food Engineering Department, 21AG65R08, 2023)
  - Mr. Pankaj Patidar (Agricultural and Food Engineering Department, 22AG65R09, 2024)
  - Mr. Gawai Dnyaneshwar P (Agricultural and Food Engineering Department, 22AG65R11,

2024)
- Mr. Rishwanth Thottempudi (Department of Physics, 19PH20036, 2024)

DSc Member

- **PhD**
  - Mr. Rishikesh Ratan (Agricultural and Food Engineering Department, 23AG91R12, Supervisor: Prof. Vishwanath Nagarajan, Joint supervisor: Prof. Dibyendu Kamilya, 2023 - present)
  - Mr. Abbas Haider (Dept of Ocean Engg & Naval Architecture, 20NA92R01, Supervisor: Prof. Vishwanath Nagarajan, 2023 - present)
  - Mr. Pradeep R (Aquacultural Engineering, Agricultural and Food Engineering Department, 22AG92R04, Supervisor: Prof. Dibyendu Kamilya, 2022 - present)

Languages

- To Read: English, Bengali, Hindi
- To Speak: English, Bengali, Hindi
- To Write: English, Bengali, Hindi