# Dr. Rakesh Kumar Sanodiya, Ph.D.

rakesh.pcs16@gmail.com 08770120278 Linkedin
Google Scholar

## Employment History

Dec-2020 – · · · · **Assistant Professor,** Department of Computer Science and Engineering, IIIT Sri City.

Feb-2020 – Dec-2020 **Research Assistant Professor,** Department of Electrical Engineering, NTUT Taiwan

## Education

2016 – 2019 **Ph.D., Computer Science and Engineering** from IIT Patna.
Thesis title: *Explorations in Metric Learning with Applications to clustering and classification.*

2012 – 2014 **M.Tech. with 8.43 (CGPA), Computer Technology and Application** from SoIT, RGPV Bhopal.

2007 – 2011 **B.E. with 75.31 (%), Computer Science and Engineering** from NIIST, Bhopal.

## Teaching

2022-2023 **Spring-23:**
Deep Learning
Robotics Intelligence
**Monsoon-22:**
Advanced data structure and Algorithm
Full Stack Development-2

2021-2022 **Spring-22:**
Robotics Intelligence
**Monsoon-21:**
Database Management System
Advanced data structure and Algorithm
Computer Programming

2020-2021 **Spring-21:**
Web Application Development
Enterprise Application Development
Data Structure and Algorithm
Probability and Statistical Theory

## Research Interests

- **Machine Learning**
  Sub Areas: *Metric Learning, Shallow Domain Adaptation.*
- **Deep Learning**
  Sub Areas: *Transfer Learning, Deep Domain Adaptation, Domain Transfer .*
- **Robotics Intelligence**

## PhD Student

- **Satya Rajendra Singh**
  Thesis Topic: *Exploration of Neural Netowrk models for Object Recognition.*
- **Ravi Ranjan Karn**
  Thesis Topic: *Exploration of Domain Adaptation Approaches for Image Classification.*

## MTech Student

2022 **Midhun V**
Thesis Topic: *Domain Adaptation for Semi-supervised Semantic Segmentation.*
Company: *Mercedes Benz.*

## BTech with Honors (Research) Student

2024 **Rushendra Sidibomma**
Project Topic: *Exploring Deep Learning Approaches for Unsupervised Domain Adaptation.*
Publication: *Conf. Pub. 11th-IEEE ESDC-2023.*

**Amal S Namboodiri**
Project Topic: *Exploring Deep Learning Approaches for Remote Sensing.*
Publication: *Conf. Pub. 11th IEEE-ESDC-2023.*

**Sampreeth Jangala**
Project Topic: *Exploring Deep Learning Approaches for Image Classification.*
Publication: *Conf. Pub. IEEE-IJCNN-2023.*

**Nitish Reddy**
Project Topic: *Exploration Deep Learning Approaches for Underwater Object Recognition.*
Publication: *Conf. Pub. 11th- IEEE ESDC-2023.*

2023 **Shreyash Mishra** (Completed )
Project Topic: *Exploration of Shallow Domain Adaptation Approaches for Image Classification.*
Publication: *Trans. Pub. IEEE TAI-2023, Joural Pub. KBS-2022, Conf. Pub. 9th IEEE UPCON-2022.*

**Priyam Bajpai** (Completed)
Project Topic: *Exploring Shallow Unsupervised Domain Adaptation Approaches for Image Classification.*
Publication: *Conf. Pub. 9th- IEEE UPCON-2022.*

## BTech with Honors (Research) Student (continued)

2022 **B Y Reddy** (Completed)
Project Topic: *Context Unaware Knowledge Distillation for Image Retrieval.*
Publication: *Conf. Pub. CVMI-2022.*

## BTech with Project Student

2023 **Group B23RKS01: Lanka Sai Ramya, Kolusu Manasa, and Sneha H S**
Project Topic: *Exploring Generative Models for Precision Agriculture.*

**Group B23RKS02: Golla Lalith, Sai Srikar, and Manohar Shashank**
Project Topic: *Exploring Metric Learning Approaches for Image Classification.*

**Group B23RKS03: Aritro Ghosh, G. Yashswi, and V. Nithin**
Project Topic: *Exploring Metric Learning Approaches for Image Classification.*

2022 **Group B22RKS01: R. Tholuchuru, V. Sathvik, and K. Sumanth**
Project Topic: *Semi-supervised Domain Adaptation.*

**Group B22RKS02:S. Kokanti, M. Shashank, and C. Anand**
Project Topic: *Metric Learning.*

**Group B22RKS03: A. Reddy, G. Chetan, and C. Teja**
Project Topic: *Unsupervised Domain Adaptation.*

**Group B22RKS04:H. Chowdary, M. Sheetal, and P. Vignesh**
Project Topic: *Virtual Try-on.*

2021 **Group B21RKS01: Y. Akhilesh, K. Hrudai, and L. Praneeth**
Project Topic: *Object Recognition.*

**Group B21RKS03: C. Nikhilesh, N. Siva, Krishna, and N. Praneeth**
Project Topic: *Pose Estimation.*

**Group B21RKS03: C. Eswara, L. Reddy, and M. Sai**
Project Topic: *Exploring Generative Model.*

**Group B21RKS04: G. Vishnu, K. Lakshmi, and D. Pravnav**
Project Topic: *Deep Domain Adaptation.*

**Group B21RKS05: V. Hanseesha, R. Anusri, and D. Neeharika**
Project Topic: *Person Re-Identification.*

**Group B21RKS06: E. Suma, V. Amrutha, and B. Sairam**
Project Topic: *Object Detection and Localization.*

## Research Publications

### Journal Articles

1. A. Devika, **R. K. Sanodiya**, B. R. Jose, and J. Mathew, "Visual domain adaptation through locality information," *Engineering Applications of Artificial Intelligence*, vol. 123, p. 106 172, 2023. DOI: 10.1016/j.engappai.2023.106172.

2. O. Gilo, J. Mathew, S. Mondal, and **R. K. Sanodiya**, "Unsupervised sub-domain adaptation using optimal transport," *Journal of Visual Communication and Image Representation*, p. 103 857, 2023. DOI: 10.1016/j.jvcir.2023.103857.

3. **R. K. Sanodiya**, S. Mishra, P. Arun, *et al.*, "Manifold embedded joint geometrical and statistical alignment for visual domain adaptation," *Knowledge-Based Systems*, vol. 257, p. 109 886, 2022. DOI: 10.1016/j.knosys.2022.109886.

4. **R. K. Sanodiya**, J. Mathew, R. Aditya, A. Jacob, and B. Nayanar, "Kernelized unified domain adaptation on geometrical manifolds," *Expert Systems with Applications*, vol. 167, p. 114 078, 2021. DOI: 10.1016/j.eswa.2020.114078.

5. **R. K. Sanodiya** and L. Yao, "Discriminative information preservation: A general framework for unsupervised visual domain adaptation," *Knowledge-Based Systems*, vol. 227, p. 107 158, 2021. DOI: 10.1016/j.knosys.2021.107158.

6. **R. K. Sanodiya**, J. Mathew, S. Saha, and P. Tripathi, "Particle swarm optimization based parameter selection technique for unsupervised discriminant analysis in transfer learning framework," *Applied Intelligence*, vol. 50, pp. 3071–3089, 2020. DOI: 10.1007/s10489-020-01710-7.

7. **R. K. Sanodiya**, S. Saha, and J. Mathew, "Semi-supervised orthogonal discriminant analysis with relative distance: Integration with a moo approach," *Soft Computing*, vol. 24, pp. 1599–1618, 2020. DOI: 10.1007/s00500-019-03990-9.

8. **R. K. Sanodiya**, M. Tiwari, J. Mathew, S. Saha, and S. Saha, "A particle swarm optimization-based feature selection for unsupervised transfer learning," *Soft Computing*, vol. 24, pp. 18 713–18 731, 2020. DOI: 10.1007/s00500-020-05105-1.

9. **R. K. Sanodiya** and L. Yao, "A subspace based transfer joint matching with laplacian regularization for visual domain adaptation," *Sensors*, vol. 20, no. 16, p. 4367, 2020. DOI: 10.3390/s20164367.

10. **R. K. Sanodiya** and L. Yao, "Linear discriminant analysis via pseudo labels: A unified framework for visual domain adaptation," *IEEE Access*, vol. 8, pp. 200 073–200 090, 2020. DOI: 10.1109/ACCESS.2020.3035422.

11. **R. K. Sanodiya** and L. Yao, "Unsupervised transfer learning via relative distance comparisons," *IEEE Access*, vol. 8, pp. 110 290–110 305, 2020. DOI: 10.1109/ACCESS.2020.3002666.

12. **R. K. Sanodiya** and J. Mathew, "A framework for semi-supervised metric transfer learning on manifolds," *Knowledge-Based Systems*, vol. 176, pp. 1–14, 2019. DOI: 10.1016/j.knosys.2019.03.021.

13. **R. K. Sanodiya** and J. Mathew, "A novel unsupervised globality-locality preserving projections in transfer learning," *Image and Vision Computing*, vol. 90, p. 103 802, 2019. DOI: 10.1016/j.imavis.2019.08.006.

14. **R. K. Sanodiya**, J. Mathew, B. Paul, and B. A. Jose, "A kernelized unified framework for domain adaptation," *IEEE Access*, vol. 7, pp. 181 381–181 395, 2019. DOI: 10.1109/ACCESS.2019.2958736.

15. **R. K. Sanodiya**, J. Mathew, S. Saha, and M. D. Thalakottur, "A new transfer learning algorithm in semi-supervised setting," *IEEE Access*, vol. 7, pp. 42 956–42 967, 2019. DOI: 10.1109/ACCESS.2019.2907571.

16. **R. K. Sanodiya**, S. Saha, and J. Mathew, "A kernel semi-supervised distance metric learning with relative distance: Integration with a moo approach," *Expert Systems with Applications*, vol. 125, pp. 233–248, 2019. DOI: 10.1016/j.eswa.2018.12.051.

## Conference Proceedings

1. B. Y. Reddy, S. R. Dubey, **R. K. Sanodiya**, and R. R. P. Karn, "Context unaware knowledge distillation for image retrieval," in *Computer Vision and Machine Intelligence: Proceedings of CVMI 2022*, Springer, 2023, pp. 65–77.

2. S. Suryavardan, V. Pulabaigari, and **R. K. Sanodiya**, "Unsupervised domain adaptation supplemented with generated images," in *Neural Information Processing: 29th International Conference, ICONIP 2022, Virtual Event, November 22–26, 2022, Proceedings, Part IV*, Springer, 2023, pp. 659–670.

3. P. Bajpai and **R. K. Sanodiya**, "A unified framework for covariance adaptation with multiple source domains," in *2022 IEEE 9th Uttar Pradesh Section International Conference on Electrical, Electronics and Computer Engineering (UPCON)*, IEEE, 2022, pp. 1–6.

4. R. R. P. Karn, **R. K. Sanodiya**, E. S. Chandaluri, S. Suryavardan, L. R. Reddy, and L. Yao, "Virtual try-on using style transfer," in *Responsible Data Science: Select Proceedings of ICDSE 2021*, Springer, 2022, pp. 131–139.

5. R. R. P. Karn, **R. K. Sanodiya**, T. Sharma, *et al.*, "A feature and parameter selection approach for visual domain adaptation using particle swarm optimization," in *2022 IEEE Congress on Evolutionary Computation (CEC)*, IEEE, 2022, pp. 1–7.

6. R. Lekshmi, **R. K. Sanodiya**, B. R. Jose, and J. Mathew, "Joint cross-domain preserving and distribution adaptation for heterogeneous domain adaptation," in *2022 IEEE 19th India Council International Conference (INDICON)*, IEEE, 2022, pp. 1–6.

7. S. Mishra and **R. K. Sanodiya**, "Scatter matrix normalization for unsupervised domain adaptation," in *2022 IEEE 9th Uttar Pradesh Section International Conference on Electrical, Electronics and Computer Engineering (UPCON)*, IEEE, 2022, pp. 1–6.

8. R. Satya Rajendra Singh, **R. K. Sanodiya**, and P. Arun, "Joint geometrical and statistical alignment using triplet loss for deep domain adaptation," in *Responsible Data Science: Select Proceedings of ICDSE 2021*, Springer, 2022, pp. 119–130.

9. R. Lekshmi, **R. K. Sanodiya**, R. Linda, B. R. Jose, and J. Mathew, "Kernelized transfer feature learning on manifolds," in *Neural Information Processing: 28th International Conference, ICONIP 2021, Sanur, Bali, Indonesia, December 8–12, 2021, Proceedings, Part II 28*, Springer, 2021, pp. 297–308.

10. **R. K. Sanodiya**, C. Sharma, S. Satwik, A. Challa, S. Rao, and L. Yao, "A novel metric learning framework for semi-supervised domain adaptation," in *Neural Information Processing: 28th International Conference, ICONIP 2021, Sanur, Bali, Indonesia, December 8–12, 2021, Proceedings, Part I 28*, Springer, 2021, pp. 165–176.

11. M. Tiwari, **R. K. Sanodiya**, J. Mathew, and S. Saha, "A particle swarm optimization based feature selection approach for multi-source visual domain adaptation," in *Neural Information Processing: 28th International Conference, ICONIP 2021, Sanur, Bali, Indonesia, December 8–12, 2021, Proceedings, Part V 28*, Springer, 2021, pp. 701–709. DOI: 10.1007/978-3-030-92307-5_82.

12. M. Tiwari, **R. K. Sanodiya**, J. Mathew, and S. Saha, "Multi-source based approach for visual domain adaptation," in *2021 International Joint Conference on Neural Networks (IJCNN)*, IEEE, 2021, pp. 1–7.

13. L. Yao, S. Prasad, **R. K. Sanodiya**, and D. Paul, "Statistical and geometrical alignment for unsupervised deep domain adaptation," in *Proceedings of International Conference on Machine Intelligence and Data Science Applications: MIDAS 2020*, Springer, 2021, pp. 433–444.

14. **R. K. Sanodiya**, P. Kumar, M. Tiwari, L. Yao, and J. Mathew, "A modified joint geometrical and statistical alignment approach for low-resolution face recognition," in *Neural Information Processing: 27th International Conference, ICONIP 2020, Bangkok, Thailand, November 23–27, 2020, Proceedings, Part I 27*, Springer, 2020, pp. 88–100.

15. **R. K. Sanodiya**, A. Mathew, J. Mathew, and M. Khushi, "Statistical and geometrical alignment using metric learning in domain adaptation," in *2020 International Joint Conference on Neural Networks (IJCNN)*, IEEE, 2020, pp. 1–8.

16. **R. K. Sanodiya**, D. Paul, L. Yao, J. Mathew, and A. Juhi, "A feature selection approach to visual domain adaptation in classification," in *Neural Information Processing: 27th International Conference, ICONIP 2020, Bangkok, Thailand, November 23–27, 2020, Proceedings, Part II 27*, Springer, 2020, pp. 77–89.

17 **R. K. Sanodiya**, S. Saha, J. Mathew, M. D. Thalakottur, and U. Aadya, "Multi-objective approach for semi-supervised discriminant analysis with relative distance," in *2019 IEEE Congress on Evolutionary Computation (CEC)*, IEEE, 2019, pp. 2808–2815.

18 **R. K. Sanodiya**, C. Sharma, and J. Mathew, "Unified framework for visual domain adaptation using globality-locality preserving projections," in *Neural Information Processing: 26th International Conference, ICONIP 2019, Sydney, NSW, Australia, December 12–15, 2019, Proceedings, Part I 26*, Springer, 2019, pp. 340–351.

19 **R. K. Sanodiya**, M. D. Thalakottur, J. Mathew, and M. Khushi, "Semi-supervised regularized coplanar discriminant analysis," in *Neural Information Processing: 26th International Conference, ICONIP 2019, Sydney, NSW, Australia, December 12–15, 2019, Proceedings, Part V 26*, Springer, 2019, pp. 198–205.

20 **R. K. Sanodiya**, S. Saha, and J. Mathew, "A multi-kernel semi-supervised metric learning using multi-objective optimization approach," in *Neural Information Processing: 25th International Conference, ICONIP 2018, Siem Reap, Cambodia, December 13–16, 2018, Proceedings, Part II 25*, Springer, 2018, pp. 530–541.

21 **R. K. Sanodiya**, S. Saha, J. Mathew, and P. Bangwal, "Semi-supervised transfer metric learning with relative constraints," in *Neural Information Processing: 25th International Conference, ICONIP 2018, Siem Reap, Cambodia, December 13–16, 2018, Proceedings, Part III 25*, Springer, 2018, pp. 230–241.

22 **R. K. Sanodiya**, S. Saha, J. Mathew, and A. Raj, "Supervised and semi-supervised multi-task binary classification," in *Neural Information Processing: 25th International Conference, ICONIP 2018, Siem Reap, Cambodia, December 13-16, 2018, Proceedings, Part IV 25*, Springer, 2018, pp. 380–391.

## R&D Projects

Co-PI — **ISRO:** Advanced methods and algorithms for automatic information extraction for (on-line/offline) processing and analysis of images/data from various multi-source data.

## Setup-Lab & Co-Founder

PI — **Robotics Intelligence-Lab:** Setup Robotics Intelligence Lab Room No. 329 at IIIT Sri City equipped with 3-D printer, all types of sensors, pre-trained robots

Co-Founder — **WADLA workshop** Founder of International Research Workshop on Advances in Deep Learning and Applications (WADLA)

## Skills

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|---|---|
| Languages | Strong reading, writing and speaking competencies for English and Hindi. |
| Coding | C/C++, Java, PHP, Python, LaTeX, … |
| Tools and Library | MATLAB, TensorFlow, Pytorch. |
| Web Dev | HTML, CSS, JavaScript, React |
| Misc. | Academic research, teaching, organizing workshops, mentoring, LaTeX typesetting and publishing. |

## Miscellaneous Experience

### Professional Recognition/ Award/Prize/Certificate, Fellowship

2023 **Session Chair**, IEEE IJCNN Conference-2023.

**Co-Convener**, ATAL Faculty Development Program.

**International Travel Grant by SERB**, To attend IJCNN Conference held at Queensland, Australia

2022 **Convener**, One-week International Research Workshop on Advances in Deep Learning and Applications WADLA 2022

2021 **Co-Convener**, One-week International Research Workshop on Advances in Deep Learning and Applications WADLA 2021

2019 **Postdoctoral Fellowship**, NTU Singapore

**International Travel Grant by CSIR**, To attend CEC Conference held at Wellington, New Zealand

**International Travel Grant by SERB**, To attend ICONIP Conference held at Sydney, Australia

2018 **International Travel Grant by MHRD**, To attend ICONIP Conference held at Siem Reap, Cambodia

**2nd Runners Up National Award**,OpenGovDATAhack

2017 **First Prize**,Smart India Hackathon

**Second Prize**,International IoT Grant Challenge

### Service

2023 **Reviewer**
**Conferences:** IJCNN-23,PReMI-23
**Journals:** Pattern Letter-Recognition, Artificial Intelligence, BMC Bioinformatics, Information Fusion, Neural Processing Letters

2020-2023 **Organizing Committee:** Technical Program Co-Chairs at 11th Edition of ESDC-2023

**Mentor:**
Students of IIIT Sri City
Gradient (Coding Club)
Nandha Infotech Startup Company (by MeitY Start-up Hub - TIDE 2.0 Scheme)

**Session Chair:** 11th Edition of ESDC-2023

**Workshop Speaker:** ATAL Faculty Development Programme

## References

**Prof Jimson Mathew**
Professor
IIT Patna,
Department of Computer Science and Engineering,
IIT Patna, Patna - 801103, Bihar, India.
jimson@iitp.ac.in

**Prof Leehter Yao**
Chair Professor
NTUT Taiwan,
Departmetn of Electrical Engineering, Complexity Building R314, NTUT, Taipei, Taiwan.
ltyao@ntut.edu.tw

**Dr. Sriparna Saha**
Associate Professor
IIT Patna,
Department of Computer Science and Engineering,
IIT Patna, Patna - 801103, Bihar, India.
sriparna@iitp.ac.in