NIKHILANAND ARYA

Assistant Professor (II)
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Education

2019-2023: **PhD, Computer Science & Engineering**, *Indian Institute of Technology*, Patna.
Research area: Computational Biology, Deep Learning, Machine Learning.
Advisor: Dr. Sriparna Saha, Associate Professor, Computer Science & Engineering, IIT Patna.

CGPA : 8.50

2017-2019 : **Master of Technology, Mathematics & Computing**, *Indian Institute of Technology*, Patna.

CGPA : 8.99/10

2011-2015 : **Bachelor of Technology, Information Technology**, *Maulana Abul Kalam Azad University of Technology*, West Bengal (*Formerly* West Bengal University of Technology, West Bengal).

CGPA : 7.89/10

2010 : **Higher Secondary Examination**, *St. Xavier's Higher Secondary School*, Bettiah.
Mathematics, Physics, Chemistry, English, Hindi

Percentage : 74.66 %

2008 : **Secondary Examination**, *Saraswati Vidya Mandir*, Bettiah.
Mathematics, Social Science, Science, English, Hindi

Percentage : 86.8 %

Publications

Journal Articles

2024 Susmita Palmal, **Nikhilanand Arya**, Sriparna Saha, and Somanath Tripathy. Integrative prognostic modeling for breast cancer: Unveiling optimal multimodal combinations using graph convolutional networks and calibrated random forest. ***Applied Soft Computing Journal***, volume 154, page 111379. Elsevier, February 2024, **(Impact Factor:8.7)**.

2024 Susmita Palmal, Sriparna Saha, **Nikhilanad Arya**, and Somanath Tripathy. CAGCL: Predicting short- and long-term breast cancer survival with cross-modal attention and graph contrastive learning. ***IEEE Journal of Biomedical and Health Informatics***, pages 1–11, 2024, **(Impact Factor:6.7)**.

2024 Archana Mathur, **Nikhilanand Arya**, Kitsuchart Pasupa, Sriparna Saha, Sudeepa Roy Dey, and Snehanshu Saha. Breast cancer prognosis through the use of multi-modal classifiers: Current state of the art and the way forward. ***Briefings in Functional Genomics***, page elae015. Oxford University Press, April 2024, **(Impact Factor:4.3)**.

2023 **Nikhilanand Arya**, Sriparna Saha, Archana Mathur, and Snehanshu Saha. Improving the robustness and stability of a machine learning model for breast cancer prognosis through the use of multi-modal classifiers. ***Scientific Reports***, volume 13, page 4079. Nature Publishing Group, March 2023, **(Impact Factor:5.556)**.

2023 **Nikhilanand Arya** and Sriparna Saha. Deviation-support based fuzzy ensemble of multi-modal deep learning classifiers for breast cancer prognosis prediction. ***Scientific Reports***, volume 13, page 21326. Nature Publishing Group, December 2023, **(Impact Factor:5.556)**.

2023 **Nikhilanand Arya**, Archana Mathur, Snehanshu Saha, and Sriparna Saha. Proposal of SVM Utility Kernel for Breast Cancer Survival Estimation. ***IEEE/ACM Transactions on Computational Biology and Bioinformatics***, volume 20, pages 1372–1383. IEEE, March 2023, **(Impact Factor:3.702)**.

2023 Susmita Palmal, **Nikhilanand Arya**, Sriparna Saha, and Somanath Tripathy. Breast cancer survival prognosis using the graph convolutional network with Choquet fuzzy integral. ***Scientific Reports***, volume 13, page 14757. Nature Publishing Group, September 2023, **(Impact Factor:5.556)**.

2022 **Nikhilanand Arya** and Sriparna Saha. Generative Incomplete Multi-View Prognosis Predictor for Breast Cancer: GIMPP. ***IEEE/ACM Transactions on Computational Biology and Bioinformatics***, volume 19, pages 2252–2263. IEEE, July 2022, **(Impact Factor:3.702)**.

2021 **Nikhilanand Arya** and Sriparna Saha. Multi-modal advanced deep learning architectures for breast cancer survival prediction. ***Knowledge-Based Systems***, volume 221, page 106965. Elsevier, June 2021, **(Impact Factor:8.8)**.

2020 **Nikhilanand Arya** and Sriparna Saha. Multi-modal classification for human breast cancer prognosis prediction: Proposal of deep-learning based stacked ensemble model. ***IEEE/ACM Transactions on Computational Biology and Bioinformatics***, volume 19, pages 1032–1041. IEEE, 2020, **(Impact Factor:3.702)**.

In Conference Proceedings

2023 **Nikhilanand Arya**, Kwanit Gupta, and Sriparna Saha. SARS-CoV-2 Detection: Radiology based Multi-modal Multi-task Framework. In *2023 45th Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC), Sydney, Australia*. IEEE, 2023.

2022 Susmita Palmal, **Nikhilanand Arya**, Sriparna Saha, and Somanath Tripathy. A Multi-modal Graph Convolutional Network for Predicting Human Breast Cancer Prognosis. In *29th International Conference on Neural Information Processing*, volume 1794, pages 187–198. Springer Nature Singapore, Singapore, 2022.

2022 Dibyendu Das, **Nikhilanand Arya**, and Sriparna Saha. Efficient-Nets and Their Fuzzy Ensemble: An Approach for Skin Cancer Classification. In *29th International Conference on Neural Information Processing*, volume 1794, pages 151–162. Springer Nature Singapore, Singapore, 2022.

Research Experience

Indian Institute of Technology Patna, India

Jan,2023 – present ***Multi-modal Pan-Cancer Survival Estimation and Multi-modal Skin Lesion classification***. Developing a deep multi-modal architecture for accurately estimating the survival of cancer patients irrespective of cancer locations in the human body. The architecture is aimed to utilize six different modalities from multi-omics, clinical, and histopathology profiles of TCGA PAN Cancer data. We are also developing multi-modal deep learning-based architectures for skin lesion classification using dermoscopy images and demographic information of the patients.

Advisors : **Dr. Sriparna Saha**, *Associate Professor, Department of Computer Science & Engineering*, IIT Patna (*Personal Web-page*)

Dr. Kitsuchart Pasupa, *Associate Professor, School of Information Technology*, King Mongkut's Institute of Technology Ladkrabang, Thailand (*Personal Web-page*)

Jan,2022 – Dec,2022 ***Developing Ensemble techniques for AI-based base classifiers for Dermoscopy Skin Lesion Classification and Breast Cancer Survival Prognosis.*** .

Developing deep learning-based multi-class skin cancer classifier with the ensemble of transfer learning-based pre-trained base classifiers to classify the skin lesion into eight different classes. Proposing the rewarding algorithm to counter the effect of class imbalance and fuzzy ensemble to dynamically allocate the importance of each base classifier towards getting better prediction accuracies. Further, enhancement of fuzzy ensemble with the help of two non-linear functions acting as deviation and support for breast cancer survival prediction.

Advisor : **Dr. Sriparna Saha**, *Associate Professor, Department of Computer Science & Engineering*, IIT Patna (*Personal Web-page*)

Jan,2021 – Dec,2021 ***Developing AI-based Generative Models to Handle Missing Data in Multi-modal Framework for Breast Cancer Prognosis.*** .

Developing a deep learning-based generative model for handling cases where patients are not having information from all the modalities. The generative model uses the power of attention technique and Generative Adversarial Networks to generate the missing data from the available data. Further developing deep learning-based classifiers using the generated and available data towards breast cancer survival prediction.

Advisor : **Dr. Sriparna Saha**, *Associate Professor, Department of Computer Science & Engineering*, IIT Patna (*Personal Web-page*)

July,2018 – Dec,2020 ***Developing Deep Learning based Multi-modal Architecture for Biomedical Problems.***.

Analysing different modalities of information from gene expression, copy number variation, and clinical details of breast cancer patients towards the prognosis prediction task. Developing various deep learning architectures that incorporate the concept of convolutional neural networks, attention mechanisms, and stacking of machine learning classifiers over deep learning architectures to classify the patients as long-term vs short-term survivors.

Advisor : **Dr. Sriparna Saha**, *Associate Professor, Department of Computer Science & Engineering*, IIT Patna (*Personal Web-page*)

BITS PILANI K K BIRLA GOA CAMPUS

July,2022 – Jan,2023 ***Towards Stability and Robustness of AI-based Multi-modal Machine Learning Classifiers for Breast Cancer Prognosis Prediction.*** .

Developing some state-of-the-art machine learning classifiers by incorporating additional sources of information from six different modalities which include clinical, genetic, and histopathological tissue images for breast cancer survival prediction. Improving stability and robustness of these classifiers by introducing some deep learning-based feature extraction techniques followed by a proposal of advanced kernel function for the Support Vector Machine classifier.

Advisor : **Dr. Snehanshu Saha**, *Professor, Computer Science and Information Systems and Co-ordinator-APPCAIR*, BITS PILANI K K BIRLA GOA CAMPUS (*Personal Web-page*)

Experience

Kalinga Institute of Industrial Technology (KIIT), Deemed to be University, Bhubaneshwar, India

Jan,2024 – Sep,2025 ***Designation: Assistant Professor***.

Role: Teaching and Research

LTIMindtree (formerly Mindtree) Limited, Bangalore, India

Oct,2015 – Jun,2017 ***Designation: Software Engineer***.

Role: Software Development and Testing

Fellowships & Awards

2024 Our article "*Improving the robustness and stability of a machine learning model for breast cancer prognosis through the use of multi-modal classifiers*" received 1983 article downloads in 2023, placing it as **one of the Top 100 downloaded Cancer papers published in Scientific Reports** in the year 2023.

2019 –2023 Ph.D. Institute Fellowship from ***Ministry of Education (MoE), Government of India***, as a PhD research scholar at Indian Institute of Technology Patna, India.

2023 Recipient of ***International Travel Support (ITS) Scheme, Science and Engineering Research Board (SERB), India*** to attend an international conference ***45th Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC), 2023*** in Sydney, Australia.

2023 ***Second Best Poster Presentation Award*** at Research Scholar Day ***(RSD 2023)***, Indian Institute of Technology Patna, India

2022 Awarded with ***Outstanding Teaching Assistant Award (2022)*** for showing remarkable performance in teaching assistantship during Autumn 2022 at Indian Institute of Technology Patna, India

2022 Recipient of Student Fellowship from ***Ministry of Education (MoE), Government of India*** for presenting a paper at the ***29th International Conference on Neural Information Processing (ICONIP 2022)***, IIT Indore, India.

2020 Recipient of Student Fellowship from ***Ministry of Education (MoE), Government of India*** for attending IEEE CIS Summer School on Emerging Research Trends in Computational Intelligence: Theory and Applications, held during November 26-30, 2020, at IIT Indore, India.

2017 – 2019 Recipient of ***GATE Scholarship*** from ***AICTE*** as a postgraduate student at the Indian Institute of Technology Patna, India.

2017 Recognised as a ***Significant Contributor (4/5)*** for consistently meeting the agreed expectations in all areas and exceeding in some areas of responsibility, and recipient of ***various recognitions (Hats Off, Spot On, Unstoppable, Strategic Thinking, A-Team, Accountability, and Partnership)*** from managers and leads while working at Mindtree Limited.

2011 Secured good rank in the highly competitive ***West Bengal Joint Entrance Examination (WBJEE)***.

2008 Recognized as the top performer in the school Magazine by securing ***3rd rank*** in the merit list of CBSE Secondary School Examination (***2008***) of Saraswati Vidya Mandir, Bettiah, Bihar, India.

Teaching Knowledge

Machine Learning, Data Mining and Data Warehousing, Data Structure and Algorithm, Operating System, Object Oriented Programming

Technical Knowledge

Python, Keras, PyTorch, Tensorflow, R, C, Edureka Certified JAVA Developer, HTML 5, PHP, JSP, Javascript, SQL, MySQL, Apache, Vskills Certified JMeter Tester, Selenium Automation

Position of Responsibility

2024 **M.Tech. Subject Coordinator**, *at KIIT, Bhubaneshwar for SDWM subject.*

2024 **Program Committee Member (Reviewer)**, *for European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML PKDD 2024).*

2023 **Volunteer**, *at 45th Annual International Conference of the IEEE Engineering in Medicine & Biology Society* ***(EMBC 2023)***, Sydney, Australia.

Teaching Assistantship

Spring, 2023 : **Executive M.Tech: Database and MySQL Tutorial**, IIT Patna.
Spring, 2023 : **Executive M.Tech: Data Structure and Algorithm Tutorial**, IIT Patna.
Spring, 2023 : **CS342: Operating System Lab**, IIT Patna.
Fall, 2022 : **CS345: Advance Database Lab**, IIT Patna.
Fall, 2022 : **CS112: Programming and Data Structure Lab**, IIT Patna.
Spring, 2022 : **CS342: Operating System Lab**, IIT Patna.
Fall, 2021 : **CS564: Foundations of Machine Learning**, IIT Patna.
Spring, 2021 : **CS342: Operating System Lab**, IIT Patna.
Fall, 2020 : **CS564: Foundations of Machine Learning**, IIT Patna.

Referees

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