Satish Kumar Keshri

J.L. Banerjee Road
Mahajan Patty, Rampurhat
West Bengal 731224, India

E-mail: skeshri96@gmail.com
Webpage: satishkeshri.github.io
Github: github.com/SatishKeshri

EDUCATION

• ***Master of Science*** July 2018 - June 2020
MSc in Big Data Analytics (Data Science)
Ramakrishna Mission Vivekananda Educational and Research Institute, India
CGPA: 9.69/10.0, ***University Gold Medalist***
Relevant Courses: Machine Learning, Artificial intelligence, Probability and Stochastic Processes, Optimization Algorithms, Multivariate Statistics, Linear Algebra, Python Programming.

• ***Bachelor of Science*** August 2015 - May 2018
BSc (Hons.) in Mathematics and Computing
Institute of Mathematics and Applications, Autonomous under Utkal University
CGPA: 8.85/10.0, ***First Class Distinction, Top of Class***
Relevant Courses: Real Analysis, Multivariable Calculus, Linear Algebra, Group and Field Theory, Statistics, Data Structures and Algorithms.

PUBLICATIONS

• ***Conference***

1. **Satish Kumar Keshri**, Nazreen Shah, and Ranjitha Prasad. 2024. On the Convergence of Continual Federated Learning. Accepted for Publication in 8th International Conference on Data Science and Management of Data (12th ACM IKDD CODS and 30th COMAD) (CODS-COMAD Dec'24).

• ***Pre-print***

1. **Satish Kumar Keshri**, Nazreen Shah and Ranjitha Prasad. 2024. On the Convergence of Continual Federated Learning Using Incrementally Aggregated Gradients. arXiv preprint arXiv:2411.07959.

RESEARCH EXPERIENCE

• ***Research Assistant*** November 2023 - Present
Infosys Centre for Artificial Intelligence (CAI), IIIT -Delhi
Hosted by Prof. Ranjitha Prasad

- Working on building efficient continual machine learning systems in centralized and federated setups to handle incremental and online data stream without compromising on model performance. Currently, I am focused on addressing "catastrophic forgetting" through developing efficient memory-replay based methods.
- In federated setups my work involves studying the effect of data heterogeneity, tackling data distribution shifts and devising Byzantine adversarially robust federated aggregation algorithms for downstream tasks.
- **Responsibilities**: Devising FL algorithms and analyzing their convergence behavior. For practical implementations, I collaborate with other PhD students, to implement the solutions in PyTorch. I am also mentoring, three third year CSE students, in developing continual federated learners for overlapping task boundary scenarios using Bayesian deep learning.

• ***Summer Research Intern*** May 2019 - July 2019
Electronics and Communication Sciences Unit

Indian statistical institute, Kolkata

- Worked on an image dehazing project using deep learning models. Proposed a novel algorithm to use the direction of deviation for estimation of airlight (environmental illumination) and transmittance from a single hazy image to completely dehaze it using a U-Net architecture in PyTorch.

WORK EXPERIENCE

• ***Data Scientist*** June 2020 - October 2023
Dr. Reddy's Laboratories, R&D Centre, Hyderabad

- Worked on developing machine learning models for text and tabular data, building custom in-house ML algorithms, insights mining and production deployment.
- **Projects**

  1. *USFDA Deficiency Analytics* using BERT based attention mechanism to provide insights on deficiency text data in drug applications for previously marketed drugs.
  2. *Auto Document Scrutinizer* for scrutinizing scientific documents before filling for a new drug approval using Google Document AI, OCR and Tesseract resulting in 45% reduction in filling time.
  3. *Machine Assisted Polymorph Search (MAPS)* to predict polymorph solid form using XGBoost. Worked in collaboration with polymorph scientists, resulting in reduction of time by 80%.
- **Responsibilities**: Independently lead data science projects and a small yet dynamic team of two junior data scientists. Experienced in stakeholder management by converting business statements into data science problems through direct interaction with the vertical heads. Also, mentored two student groups from NIT/IIT during an in-house data science hackathon to develop an automatic brand name generator using text data and phonetic scoring of the generated brand names.

• ***Data Science Intern*** Feb 2020 - May 2020
Dr. Reddy's Laboratories, Hyderabad

- Worked on a team to developed a solution to automatically generate keywords and checklists from past U.S. Food and Drug Administration (USFDA) observation letters using NLP algorithms such as Topic Modeling and word embedding vectors from Transformer based models. Our application helped approximately 150 people, in Regulatory office, to mistake-proof their future drug application filings.

• ***Summer Internship*** May, 2017 - July, 2017
Mathematics Department, IIT Guwahati

- Worked under the guidance of Prof. Anjan K. Chakrabarty and did extensive study on the topic "Analysis in Metric Spaces". Various metrics are utilized in diverse loss functions within the realm of machine learning. For instance, distance-based metrics are employed to measure similarity in clustering tasks, while dissimilarity-based metrics find application in contrastive loss functions. Received internship funding from DST, Govt. of India.

HONORS AND AWARDS

- **Best Poster Paper Award** at the 26th International Conference on Distributed Computing and Networking (ICDCN), 2025.
- **Qualcomm Travel Grant** to attend and present work at the 26th International Conference on Distributed Computing and Networking (ICDCN), 2025.
- **ET Datacon Award, 2022** from The Economics Times, India for best analytics project during my tenure at Dr. Reddy's Laboratories, India.
- **Gold Medal**, awarded for University First Rank and Academic Excellence in my Master's, 2020.

- **Special Mention Award**, for outstanding summer project thesis from Electronics and Communication Sciences Unit, Indian Statistical Institute, Kolkata, 2019.
- **INSPIRE** Scholarship, awarded by Department of Science and Technology (DST), Govt. of India, 2015 for being top 1000 among 230K STEM undergraduate students.

PRESENTATIONS AND TALKS

- Poster presentation and talk on continual federated learning at the 26th International Conference on Distributed Computing and Networking (ICDCN), IIT Hyderabad, India.
- Continual and Federated Learning: Spotlight talk at the CODS-COMAD 2024, IIT Jodhpur, India.

TECHNICAL SKILLS

- *Programming Languages*: Python, R.
- *Python Libraries*: PyTorch, Keras, NumPy, Pandas, Matplotlib, Seaborn, Scikit-learn, NLTK, Avalanche.
- *OS/Platforms*: Linux, Conda, Jupyter, Git, Google Cloud Platform (GCP), Tableau, Google Doc AI.
- *Machine Learning*: Linear Regression, Logistic Regression, K-Nearest Neighbors (KNN), Support Vector Machines (SVM), Decision Tree, Principal Component Analysis (PCA), K-Means Clustering.
- *Deep Learning*: RNN, LSTM, BERT, CNN, ResNet.

REFERENCES

- ***Ranjitha Prasad***
  Assistant Professor, ECE
  IIIT Delhi, India
  Email: ranjitha@iiitd.ac.in

- ***Swami Vidyapradananda***
  Assistant Professor, Department of Computer Science
  Ramakrishna Mission Vivekananda Educational and Research Institute, Belur, India
  Email: vidyapradananda@gm.rkmvu.ac.in

- ***Arijit Chakrabarty***
  Professor, Theoretical Statistics and Mathematics Unit
  Indian Statistical Institute, Kolkata, India
  Email: arijitc@isical.ac.in