Satish Kumar Keshri

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EDUCATION

• ***Master of Science*** July 2018 - July 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

• ***Bachelor of Science*** August 2015 - May 2018
BSc (Hons.) in Mathematics and Computing
Institute of Mathematics and Applications, Bhubaneswar, India
CGPA: 8.85/10.0, First Class Distinction, Top of Class
Relevant Courses: 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

• ***Pre-doctoral Research Assistant*** November 2023 - Present
Centre for Artificial Intelligence (CAI)
Indraprastha Institute of Information Technology, Delhi (IIIT -Delhi)
Hosted by Dr. Ranjitha Prasad

- Working on building continual learners in centralized and federated setups. 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 with theoretical convergence guarantees.
- **Responsibilities**: For the theoretical parts I mostly work independently. I collaborate with Nazreen Shah, a PhD student, to implement the solutions in PyTorch. I am also mentoring Jyotirmaya Singh, a third year BTech. student, in developing continual federated learners for overlapping task boundary scenarios using Bayesian learning.

• ***Summer Research Intern*** May 2019 - July 2019
Electronics and Communication Sciences Unit
Indian statistical institute, Kolkata

- As part of a deep learning based image dehazing project, I 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. Then trained a U-Net to get this direction and used it in the algorithm.

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 attention mechanism based textual insights for previously marketed drugs.
  2. *Auto Document Scrutinizer* for scrutinizing scientific documents before filling for a new drug approval using Google Document AI 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 and materials cost 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 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.

HONORS AND AWARDS

- **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 at the 26th International Conference on Distributed Computing and Networking (ICDCN), IIT Hyderabad, India (upcoming, Jan 2025).
- Continual and Federated Learning: Spotlight talk at the CODS COMAD 2024, IIT Jodhpur, India (upcoming, Dec 2024).

TECHNICAL SKILLS

- Programming Languages: Python, R.
- Programming Librraries: PyTorch, NumPy, Pandas, Keras, Matplotlib, Scikit-learn.
- Others: LaTeX, Tableau, Git, Excel, Google Cloud (GCP).