Akash Choudhuri

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Education

- **The University of Iowa** — Iowa City, USA
  Doctoral Degree with MS along the way: *Computer Science;* ***GPA:*** *3.76/4.0* — *January 2022 - Present*
- **Institute of Mathematics and Applications** — Bhubaneswar, India
  Master of Science: *Mathematics with Data Science;* ***GPA:*** *8.70/10* — *July 2019 - July 2021*
- **Birla Institute of Technology** — Mesra, India
  Bachelor of Science: *Mathematics and Computing;* ***GPA:*** *8.0/10* — *July 2016 - June 2019*

Publications

- **Akash Choudhuri, Hieu Vu, Kishlay Jha, Bijaya Adhikari**: Domain Knowledge Augmented Contrastive Learning on Dynamic Hypergraphs for Improved Health Risk Prediction, In publication Process, Proceedings of The 25th SIAM International Conference on Data Mining (SDM), 2025.
- **Akash Choudhuri, Yongjian Zhong, Mehrdad Moharrami, Christine Klymko, Mark Heimann, Jayaraman Thiagarajan, Bijaya Adhikari**: Conformal Edge-Weight Prediction in Latent Space, In publication Process, Proceedings of The 25th SIAM International Conference on Data Mining (SDM), 2025.
- **Akash Choudhuri, Philip M. Polgreen, Alberto M. Segre, Bijaya Adhikari**: Summarizing Clinical Notes using LLMs for ICU Bounceback and Length-of-Stay Prediction, In publication Process, Proceedings of 12th Data Mining in Biomedical Informatics and Healthcare (DMBIH '24) Workshop at The IEEE International Conference on Data Mining, 2024.
- **Akash Choudhuri, Hankyu Jang, Alberto M. Segre, Philip M. Polgreen, Kishlay Jha, Bijaya Adhikari**: Continually-Adaptive Representation Learning Framework for Time-Sensitive Healthcare Applications, In publication, Proceedings of The 32^{nd} ACM International Conference on Information and Knowledge Management, 2023 (https://dl.acm.org/doi/10.1145/3583780.3615464).
- **Akash Choudhuri**: A Hybrid Machine Learning Model for Estimation of Obesity Levels, In Data Management, Analytics and Innovation: Proceedings of ICDMAI 2022, Springer Nature (https://doi.org/10.1007/978-981-19-2600-622) .

Technical Skills

- **Languages**: Python, JAVA, R, C, MATLAB
- **Frameworks**: Scikit, PyTorch, TensorFlow, Keras, Flask, H3, Pyspark, AWS
- **Tools**: GIT, MySQL

Professional Experience

- **Lawrence Livermore National Laboratory** — Livermore, USA
  Intern, Data Science Summer Institute — *May 2023 - August 2023*
  - **Uncertainty Quantification of Weighted Link Prediction in Graphs (Summer Project)**: Researched and Developed a conformal prediction algorithm to compute the uncertainty bounds of link prediction using GCNs at a feature level. Accepted for publication at SDM 2025
  - **Cardiac Electrocardiography using Machine Learning (DSSI Challenge Problem)**: Fine-tuned and created different ML Models like XGBoost and a hybrid MLP+Randomforest Classifier algorithm. Created a hybrid model that gave 12% gain in accuracy in the MIT-arrhythmia dataset.
- **Data Sutram** — Kolkata, India
  Data Scientist — *July 2021 - December 2021*
  - **Optimized Algorithm for Delivery Management Systems**: Created a real-time optimization algorithm to assign orders to delivery executives in last-mile delivery services.
  - **Dynamic Footfall**: Found metrics to compute dynamic footfall of places in India using internet devices ping data.
  - **Improved geo-coding Wrapper**: Created a wrapper method that uses Google APIs to geocode Indian addresses.
- **Solytics Partners** — Pune, India
  Intern and later Consultant (Data Science) — *April 2020 - July 2021*
  - **Financial Model Testing**: Worked on validating a Credit Risk Model of the World Bank and performed additional stress testing experiments.
  - **Auto ML Model**: Worked on creating various pipelines for creating an Auto ML and Deep Learning platform for credit risk scoring.
  - **Pyspark integration with Keras Models**: Worked on creating Pandas UDFs to customize Neural Networks on Spark.

Current Submissions and Posters

- **Implicit Hypergraph Neural Networks**: In submission, KDD 2025.
- **Designing Near-Optimal Spatial Vaccine Allocation Strategies**: Poster- MIDAS Annual Meeting Lightning Talk, October 2023.
- **Analyzing greedy vaccine allocation algorithms for metapopulation disease models**: In submission, PLOS Computational Biology.
- **Predicting CDI using the text of clinical notes**: In submission, Open Forum Infectious Diseases (OFID).

Current Projects

- **Denoising Graphs using Noisy representations**: Most of the prior works in this domain exploit certain properties in graphs to create robust network representations. However I want to explore if the idea of Noise2Noise that is popular in images can generalize to graphs or not.
- **PU Learning on Hypergraphs**: While modern models frame disease incidence as a binary classification, it is not aligned to the true nature of the problem, especially for infectious diseases that also have asymptomatic carriers. With hypergraph learning being a natural way of aggregating information in this case, I want to extend Positive Unlabeled (PU) Learning to also detect asymptomatic cases.
- **Implicit Hypergraph Neural Network**: Due to the message passing scheme where information is aggregated over multiple nodes at a time, oversmoothing is exemplified in hypergraph learning with severe performance degradation when trying to exploit long range dependencies. On that note, as implicit models have obtained success in graphs as well as dynamic graphs, I want to explore this direction for hypergraphs as well.

Important Talks

- **CDC MIND Group Meeting 2023**: Presented initial motivations about the integration of clinical notes for CDI incidence prediction and CCMI prediction and presented the results of our paper titled "Continually-Adaptive Representation Learning Framework for Time-Sensitive Healthcare Applications".
- **LLNL Summer Slam 2023**: Presented initial approach to computing uncertainty bounds for weighted link prediction in graphs at the Summer Slam at Lawrence Livermore National Laboratory.
- **Tutorial Series 49th Annual Conference of the Odisha Mathematical Society, 2020**: Presented an introductory tutorial on using ANNs for credit risk estimation.

Academic Service

- **International workshop on Epidemiology meets Data Mining and Knowledge Discovery (epiDAMIK @ KDD)**: Program Committee Member and reviewer of the conference for 2022 and 2023.
- **Informatics in Medicine Unlocked (IMU)**: Reviewer for the journal in 2022, 2023 and 2024.
- **IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM)**: Subreviewer for the 2023 and 2024 editions of the conference.
- **IEEE International Conference on Data Engineering (ICDE)**: External Reviewer for the 2024 edition of the conference.
- **Association for the Advancement of Artificial Intelligence (AAAI)**: Subreviewer for the 2021,2022,2023 editions.
- **SIAM Conference on Data Mining (SDM)**: Subreviewer for the 2021,2022,2023 editions.
- **International Joint Conference on Artificial Intelligence (IJCAI)**: Subreviewer for the 2022 and 2023 editions.
- **ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)**: Reviewer for the 2024 edition.
- **ACM CIKM**: Subreviewer for the 2024 edition.
- **The Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD)**: Subreviewer for the 2025 edition.

Honors and Awards

- **NSF-SIAM Travel Award**: Awarded a sum of $650 with free registration to present works in SDM 2025.
- **UIOWA CS Department Travel Grant**: Awarded a sum of $600 to present works in CIKM 2023.
- **UIOWA Graduate Student Senate Travel Grant**: Awarded a sum of $1000 to present works in CIKM 2023.
- **UIOWA Graduate and Professional Student Government Travel Grant**: Awarded a sum of $400 to present works in CIKM 2023.
- **Focus Areas in Science and Technology Summer Fellowship**: From the Indian Academy of Sciences from May-June, 2019.
- **Summer Research Fellowship**: From the Indian Academy of Sciences from May to July 2018.

References

- **Bijaya Adhikari**: Assistant Professor, Department of Computer Science, University of Iowa. bijaya-adhikari@uiowa.edu
- **Kishlay Jha**: Assistant Professor, Department of Electrical and Computer Engineering, University of Iowa. kishlay-jha@uiowa.edu