Avishek Bose

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Hiring Team

May 9, 2024

Analytics and AI Methods at Scale (AAIMS) group,
National Center for Computational Science (NCCS), Oak Ridge National Laboratory (ORNL)
Oak Ridge, TN, United States

Job Application for Research Scientist, HPC and AI

Dear Hiring Manager,

My name is Avishek Bose; a passionate machine learning (ML) researcher working as a postdoctoral research associate in the Learning Systems Group, Data and AI Systems Section, Computer Science and Mathematics Division (CSMD) at Oak Ridge National Laboratory (ORNL). My experience in ML ranges from using deep learning (DL) in graph-structured data representations such as material molecular structure, critical infrastructure networks, and social networks to using LLMs for material and drug discovery research. I am actively looking for a research staff/scientist/engineer position in industries and government offices in the AI/ML domain and related areas.

Since Jan 2023, I have been working on a couple of DOE, and NIH-funded projects at ORNL, notably *Ascend* and *NAERM*. In all these projects, I have learned a lot of cutting-edge ML/DL techniques and their applications in other domains besides computer science spanning from material science to geoinformatics. Learning the subject matter previously unknown to me, I have been able to apply this scientific knowledge to even broader aspects for the good of government and people. I have also become familiar with time-critical and access-controlled government projects at ORNL. Before joining ORNL, I earned my Ph.D. from the Department of Computer Science at Kansas State University (K-State) where I worked as a graduate research assistant in the Knowledge Discovery in Databases (KDD) lab on projects related to cyber threat intelligence (CTI), natural language processing (NLP), social network analysis (SNA), and high-performance computing (HPC) analytics. While working on the *HPC analytics* project, I explored the potential of graph neural network (GNN) models to predict submitted job status and resource requirements that had never been done before.

By deepening my knowledge in graph learning theory, I have become experienced in leveraging GNNs in material science, power outage prediction during extreme weather events, isocontour analysis, drug discovery research, etc. To benefit from the groundbreaking advancement in LLM research, I have utilized domain-specific LLMs in many applications such as material property prediction, knowledge base generation, etc. I am using LLMs to solve an important but less researched problem of drug effect prediction using LLMs trained in scientific publications. I have extensive experience using a wide range of ML/DL, and NLP tools, including PyTorch Geometric (PyG), PyTorch, scikit-learn, Networkx, Tensorflow, Keras, Hugging Face, etc. In addition, my role as a project consultant in a KDOT-funded project at K-State for building effective statistical models on paved-road distress prediction enriched my cross-domain research experience.

In addition to my research responsibilities, I have been contributing to the research community as a reviewer of several reputed journals and conferences, including IEEE Transactions on Neural Networks and Learning Systems (TNNLS). I led the NLP research division and served as the personnel manager at KDD lab, K-State. I have experience in mentoring masters and undergrad students and help writing research proposals as Co-PI. I also served as the president of the Computer Science Graduate Student Association (CSGSA) at K-State.

I consider myself a diligent, self-motivated, and technology-loving person who values creativity, and cooperation. I believe working as a research staff/computational scientist in this team would be a great opportunity to take my research work to the next level and contribute to the community. I would highly appreciate answering any questions. So, please feel free to contact me.

Sincerely,

Avishek Bose