Rakesh Bal

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Education

University of California, Los Angeles	**Los Angeles, CA**
Master of Science in Computer Science (GPA - 3.81/4.0)	2021– Jun 2023 (Expected)
Indian Institute of Technology (IIT) Kharagpur	**Kharagpur, India**
Bachelor of Technology in Computer Science and Engineering (GPA - 9.04/10.0)	2016–2020

Work Experience and Internships

Amazon Web Services (AWS) — **San Francisco, US**
Applied Scientist Intern - Project Code: GitHub — Jun'22 - Sep'22
- Analysed the performance of Protein Language Models (based on Transformers) on Drug Target Interaction (DTI) problem
- Obtained 20% & 12% performance improvement with ProtBERT over two datasets compared to the baseline DTI models
- Used large AWS GPU Clusters and services like S3, EC2, SageMaker, Lambda for training pipelines and dashboards
- Devised ways to add Physics-based equations to existing models and published our work in an Amazon conference

Goldman Sachs — **Bangalore, India**
Analyst, Engineering Division — Aug'20 - Sep'21
- Integrated two internal bug & issue tracking softwares as a full-stack development project and worked on their cloud migration
- Implemented backend (with RESTful APIs) using Java/SpringBoot and frontend using TypeScript/Angular & Redux
- Coordinated with end-users for the entire SDLC; deployed project to production and handled adoption by over **10000** users

Accenture Technology Labs — **Bangalore, India**
Research Intern — May'19 - Aug'19
- Worked on stock price prediction using news articles and knowledge graphs (KGs) to provide domain information
- Used GCNs with events for real-world stock scenarios leading to performance improvement of 5% from baseline

University of California, Los Angeles — **Los Angeles, US**
Graduate Teaching Associate — Sep'21 - Present
- Led discussion sections and office hours for *500* undergrad students in CS32 and Chem 20A courses for 5 quarters

Publications

Analysing the Extent of Misinformation in Cancer Related Tweets [Link]
- Authored by **Rakesh Bal***, Sayan Sinha*, Swastika Dutta, Rishabh Joshi, Sayan Ghosh, Ritam Dutt
- *14th International AAAI Conference on Web and Social Media (**ICWSM** 2020) [25 citations]*

Two-Sided Fairness in Non-Personalised Recommendations [Link]
- Authored by Aadi Swadiptio Mondal*, **Rakesh Bal***, Sayan Sinha*, Gourab K. Patro
- *35th AAAI Conference on AI (**AAAI** 2021) Student Abstract and Poster Program* — * - equal contribution

Relevant Projects

Autonomous Underwater Vehicle (AUV), IIT Kharagpur [Link]
- Implemented real-time underwater buoy detection using MobileNet and made inference of the models lightweight
- Used ROS packages like Actionlib and Smach to implement the Mission Planner Stack, participated in SAVe at NIOT, Chennai

CLIP for Visual Question Answering (VQA) [Link]
- Worked on leveraging OpenAI CLIP in existing VQA models like MCAN and Pythia in both zero-shot and finetune settings
- Used Language Driven Semantic Segmentation (LSeg) for answering number-based questions in the VQA 2.0 dataset

Text Graph Convolutional Networks (GCNs) [Link]
- Investigated TextGCN by reproducing the model's results and adding new components on 5 different text classification datasets
- Designed new graph construction algorithms and improved the time cost of graph construction in TextGCN model

Multilingual Knowledge Graph Completion (KGC) with Zero Seed Alignment [Link]
- Explored different techniques for Multilingual KGC using Self-Supervised Adaptive Graph Alignment on DBP-5L for 5 languages
- Leveraged BERT to generate seed alignments without any prior seed information and achieved par results with baseline

Skills

Languages: Python, Java, C, C++, C#, JavaScript, TypeScript, Matlab, Lisp
Frameworks: PyTorch, Tensorflow, ROS, OpenCV, Angular, React, Node.js, Spring, Kafka, AWS, MySQL, MongoDB, Docker

Achievements

- Participated in Winter Camp and awarded Certificate in drill and weapon training at National Cadet Corps (NCC) — Aug'18
- Secured All India Rank 265 (200K candidates) in IIT-JEE Advanced and 187 (13M candidates) in IIT-JEE Mains — Jun'16
- Secured 5th position in District Level Chess Championship held at SCS College, Puri amongst 1000 players — Jan'10