Aditeya Baral

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RESEARCH EXPERIENCE

Cisco Systems
Applied Research Collaborator

Bangalore, India
July 2022 – Present

- ***Instruction fine-tuning LLMs*** like **Mistral** and **Llama-2** on-prem to enable secure and cost-effective AI solutions such as ***translation*** and ***RAG*** for engineers and customers
- Led the initiative to build a ***novel pre-training strategy*** for conversational data using **PyTorch** and **HuggingFace** and integrated it with Webex
- Developed the **Webex Contextual Search Engine** and ***improved information retrieval, searching, recommendations and topic modelling*** with minimal overhead latency
- Assisted in integrating the **OpenAI GPT-3.5 LLM API** with the ***Webex Assistant*** to **add summarisation capabilities** to message threads and meeting transcripts

Intel Corporation
Applied Research Scientist Intern

Bangalore, India
August – December 2021

- Explored **Few-Shot Learning Object Detection** (FSOD) techniques to reduce ***catastrophic forgetting*** in constrained driving environments
- Investigated and designed ***novel attention mechanisms*** to learn ***inter-object relationships*** using **PyTorch**
- Outperformed all existing approaches at the time by **0.2 mAP** and **3 mAP** on base and novel classes on the ***Few-Shot India Driving Dataset***, a benchmark for FSOD

Center for Cloud Computing and Big Data, PES University
Applied Research Intern

Bangalore, India
May – July 2020

- Compiled and used **TailBench** for simulation of application loads to monitor performance and analyse results
- Explored ways to ***reduce tail latencies*** in latency-critical applications such as translation and image recognition

WORK EXPERIENCE

Cisco Systems
Big Data Analytics Engineer – Webex Media Quality Analytics

Bangalore, India
July 2022 – Present

- Develop and maintain streaming jobs using **Scala** and **Flink** for ***Media Quality Analytics Services*** to compute and process real-time data from Webex Calls and Meetings
- Optimise and enhance ***Webex Logs & Analytics*** dashboards using **Iceberg** and **Pinot** to set up alerts and visualise real-time metrics and KPIs for clients and customers

Big Data Analytics Engineering Intern - Webex VideoMesh Analytics and APIs

January – June 2022

- Contributed to the migration of the ***VideoMesh Meetings Analytics Engine*** from Java to **Scala** and Spark to **Flink** to significantly reduce processing time and improve real-time report generation
- Built customer-facing applications using **Python** and **Flask** and supported the development and global roll-out of ***Webex VideoMesh Developer APIs***

EDUCATION

PES University
Bachelor of Technology in Computer Science & Engineering, GPA - 8.71/10.00
Specialization: Machine Intelligence & Data Science

Bangalore, India
2018 – 2022

PUBLICATIONS

ChatBERT - Multi-task approach to Pre-Training for Structured Conversations   Under Review
Authors: Aditeya Baral, Work done as part of Cisco Systems

CalBERT - Code-mixed Adaptive Language Representations using BERT   AAAI-MAKE 2022
Authors: Aditeya Baral, Aronya Baksy, Ansh Sarkar, Deeksha D, Dr. Ashwini M Joshi

MAPLE - MAsking words to generate blackout Poetry using Seq2Seq LEarning   ICNLSP 2021
Authors: Aditeya Baral, Himanshu Jain, Deeksha D, Dr. Mamatha H R

Analysis of Kepler Objects of Interest using ML for Exoplanet Identification   IEEE CONIT 2021
Authors: Ameya Rajendra Bhamare, Aditeya Baral, Saarthak Agarwal

Research Projects

MAPLEv2 - Multi-task Approach for generating blackout Poetry with Linguistic Evaluation
An approach to more coherent and creative blackout poetry generation by leveraging multiple linguistic evaluation tasks

ParaphraseLDM - Improving Paraphrase Generation using Lexical Diversity Maximization
Generation of syntactically diverse paraphrases by maximising lexical diversity metrics to reduce text overlap

Automated Essay Grading using Knowledge Graph Decomposition
An approach to rapid automated grading of essays using self-supervised knowledge-graph decomposition

Object-Aware Video Indexing
A self-supervised mechanism of tagging and querying video databases using object detection and semantic querying

Teaching Experience

Teaching Assistant, UE19CS322: Big Data Bangalore, India
PES University *June – December 2021*
Setup automated grading of submissions, designed and reviewed coursework, assignments and project deliverables, and conducted hands-on sessions on Hadoop and Spark for a class of **600+** enrolled students

Awards and Scholarships

- *Second Place* out of 20+ teams at **Webex Analytics Datathon 2024**

- *First Place internationally* out of 250+ teams at **Webex IDEA Hackathon 2023**

- *Regional level Winner* and *Top 20 finish internationally* out of 250+ teams at **Webex Playtime Hackathon 2022**

- 2x **Prof. MRD Scholarship Awardee**, 3x **Distinction Award Certification** and **Prof. CNR Rao Scholarship Awardee** for being among the **top 20%** in the Computer Science & Engineering Department

- *Research Contribution Award* from **PES University** for my contributions to the ML research community

- *Finalist* at national contests and Hackathons such as **Intel Technovation**, **Flipkart GriD**, **IISc** and **IBM Hackathons**

- *National newspaper coverage* for an Android app that schedules garbage collection in the city

Skills

Languages: Python, Scala, Java, C, R, Octave, SQL
ML/Stats: PyTorch, Tensorflow, HuggingFace, NLTK, pandas, NumPy, scikit-learn, seaborn, matplotlib
Artificial Intelligence Techniques: Representation Learning, Transfer Learning, Few-Shot Learning, Language Models, Natural Language Understanding
Big Data: Hadoop, Kafka, Spark, Flink, Iceberg, Pinot, ELK
Frameworks/Tools: Git, Docker, Flask, Grafana, PSQL, MongoDB, AWS, Linux Systems

Services and Volunteering Experience

Speaker, Guest Lecture on - Building Foundation Models using Transformers Bangalore, India
PES University *September 2023*
Delivered a guest lecture to undergraduate students on the advancements in natural language understanding and representation learning techniques and highlighted the applications of foundation models

Core Team Bangalore, India
The Amateur Scientist 2018 & 2019, Epsilon 2019 – National Level Science Fests, PES University *2018 – 2019*
Held technical and marketing managerial duties and assisted in the organisation of fests by planning and executing activities and events

Volunteer Bangalore, India
Bootstrap, PES University *August 2018*
Assisted in cleaning and repainting old government schools and orphanages in the city as a part of the University outreach program