AASTIK

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EDUCATION

MTech in CSE - Indian Institute of Technology (IIT), Bombay *Aug'21 - Jun'23*
Specialization: *Machine Learning and Artificial Intelligence* - CPI 9.5

SKILLS

Languages: Python(Django, Flask), C/C++, Java, Rust, Kotlin
ML Frameworks: TensorFlow, PyTorch, Keras, Scikit-learn, ONNX
Data Processing: Pandas, NumPy
Tools: Docker,Git,MLOps

EXPERIENCE

Senior Machine Learning Engineer *(Aug'23 - Present)*
Samsung Research India *India*
Semantic Search using Vision Language Model Pipeline

- Transitioned from tag-based to natural language search using Vision Language Models (VLM) on edge devices, improving search relevance for **10 million+ flagship devices**.
- Experimented with a novel training regime of subset selection of negative pairs via submodular selection in SIGLIP for image-text alignment pretraining for **faster training**.
- **Proposed new metrics (Recall@80p)** for Image retrieval task, and optimized VLM pipelines on edge devices, **reducing model size by 16% and inference time by 25ms per inference.**

NEXIN:**N**egative **Ex**clusion **In**ference

- Proposed and implemented **NEXIN**, a novel preprocessing technique for exclsuion search queries, **improving result accuracy by over 85% for** ΔU.
- Introduced the Barrier Potential (ΔU) to evaluate the ordering of positive and negative images.
- Authored and submitted the **NEXIN paper to EMNLP 2024**, covering 100+ hours of research and development, playing a pivotal role as the main contributor.

TestSuite

- Developed a model evaluation tool(TestSuite) used by 5+ teams, **cutting evaluation time by 50**%.
- Owned full lifecycle of the project, from initial development to ongoing maintenance, ensuring its continuous improvement and alignment with evolving team needs.
- Built a tool to evaluate 7 VLM pipelines on 60+ datasets, saving 200+ man-hours/month.

PROJECTS

Multitask federated Learning [(GitHub)] *(Aug'22-Jun'23)*

- Led a **joint IIT Bombay and Massachusetts Institute of Technology (MIT)** team on federated learning, enabling collaboration among clients with different tasks while maintaining data privacy.
- Analyzed the impact of federated knowledge distillation compared to non-collaborative training.
- Submitted short paper in **CIKM 2023**

Hostel Mess Review System [(GitHub)] *(Jul'21-Nov'21)*

- Developed a mess review system using Django, integrated with **Institute LDAP for authentication**.
- Implemented dual user roles: admins to manage students and dishes, and students to review food.
- Created a complaint redressal and campaign system, allowing students to submit issues, vote on food changes.

Jugaad Marketplace [(GitHub)] *(Jul'18-Aug'18)*

- Built a second-hand book marketplace using CodeIgniter PHP framework.
- Designed responsive UI with Bootstrap for smooth user experience.
- Deployed on college campus, achieving **100+ listings** and **200+ user registrations**.

PUBLICATIONS & ACHIEVEMENTS

- Published [paper] in International Conference on **Computational Performance Evaluation** (ComPE) 2021 and won the **Session's best paper award**.
- Secured **AIR 12** GATE CS & IT 2021 among 100k+ aspirants.