Avani Gupta

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EDUCATION

IIIT HYDERABAD
B.Tech(Hons.), 2022
CGPA: 8.42/10
MS by research, 2023
Computer Science

Relevant Coursework: Computer Vision, Computer Graphics, Adv. DL, Information Extraction, Adv. NLP, Optimization Methods, Statistical methods in AI, Game Theory, Data Analytics, Data-Visualization, DIP, Robotics, Distributed Systems

SKILLS

Languages: Python, C/C++, SQL, Matlab.
Libraries: PyTorch, Tensorflow, HuggingFace, jax, keras, OpenCV, gym.
Frameworks: Heroku, Git, OpenGL, Blender, Flask, MERN.

ACHIEVEMENTS

- SemEval 2022, 10th global rank in Chinese; 15th global in English and Spanish NER
- Global Rank 14: Amazon ML challenge 2021
- National Winner, Software edition, Smart India Hackathon, 2020
- National Winner, Microsoft's Mars Colonization Program, 2020
- Microsoft Codess, 2020

POSITIONS

- **AI mentor:** TalentSprint, 2022-23 Mentored working professionals.
- **Teaching Assistant, 2021** Statistical Methods in AI
- **AiCrowd Organiser, 2021** Organised ML Battleground at AI Crowd as part of Techno-cultural fest, IIIT H. Designed problem statements and generated data.
- GANs Workshop Organizer, 2021
- **Mentee, Microsoft** | Developed Heuristic path finding algorithms project | Winner all over India among the internal hackathon.
- **Student Researcher, Robotics Research Center** Reinforcement Learning Algorithms in Robotics

EXPERIENCE

G42 HEALTHCARE | Research Associate (areas: NLP, AI)
March 2023 - Present | Abu Dhabi, UAE
Worked on building foundation models (LLMs) on large scale real-time Electronic Health Records (EHRs) from hospitals. Trained GPT2 from scratch to predict procedures, diagnosis and medications for patients. Used it for chronic disease identification, mortality prediction and personalised medicine. Also worked on training dataset creation and evaluation of Clinical LLM. Outcomes: Med42 released on HuggingFace; two authored papers (under review) (SQL, Pytorch, HuggingFace)

CVIT, IIIT H | Researcher (Areas: ML Interpretability, CV)
May 2020 – March 2023
Developed novel interpretability based model evaluation and training methods. Used human centered abstract concepts for model disentanglement evaluation and finetuning via a proposed loss function. Concepts helped to align model with human understanding thereby improving model generalization. Used concepts to debias for complex biases like age in gender classification and induce prior knowledge in a real-world reconstruction problem. (Blender, Pytorch)

IBM RESEARCH | Research Intern (areas: NLP, RL, AI)
May 2021 - August 2021 | Bangalore, India
Built a novel system for Goal-Oriented Next Best Action Prediction in Business Processes using RL: Preprint and US. patent.
Also worked on forecasting and handling IT errors in Business Processes and authored a paper in CODS-COMAD. (Tensorflow, Pytorch, Gym, HuggingFace)

SCRAPSHUT | Intern (Areas: NLP, AI)
Jan 2020 – May 2020 | Hyderabad
Developed web-app for real-time fake news detection. Used Online learning models for prediction, wrote custom web-scraper. (Django, Keras) view project

PUBLICATIONS

- Evaluating Fine-Tuning Strategies for Medical LLMs: Full-Parameter vs. Parameter-Efficient Approaches | Under Review
- Concept Distillation: Leveraging Human-Centered Explanations for Model Improvement | **Neurips 2023 (top AI conference)** | view paper.
- Predicting Business Process events in presence of Anomalous IT errors | CODS-COMAD 2024 | view paper
- Interpreting Intrinsic Image Decomposition using Concept Activations | ICVGIP, 2022 (**Oral, Best paper award**) | view paper
- Goal-Oriented Next Best Activity Recommendation using Reinforcement Learning | view preprint
- CitRet: A Hybrid Model for Cited Text Span Retrieval | **Coling, 2022** | view paper
- Abstract representation of visual stimuli from neural recordings using deep generative models | Poster, ESI Sync, 2020
- Fake News Detection using Deep Learning based Natural Language Processing | Poster, HiPC, 2019

SELECTED PROJECTS

- **Style Transfer:** Transfer style of images using auto-encoder. (PyTorch)
- **Adversarial Neural Cryptography:** LSTM-based encryption. (Tensorflow)
- **Scisumm-shared task** Summarization of scientific documents using BERT. (PyTorch)
- **Pose Graph Optimization for SLAM** (g2o, jax)
- Smart Library Management System | SIH 2020 | Winner all over India
End to end Library Management app: auto-tagger for books, recommendation engine, QR based issuing of books, admin dashboard, chatbot. (Flutter, Firebase, Pytorch)
More Projects