Los Angeles, US
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DHIRAJ CHAURASIA

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EDUCATION

Los Angeles, US — **University of Southern California** — **August 2022 – May 2024**

- MS in Computer Science (Artificial Intelligence). CGPA: 3.75/4
- Courses: Foundations of Artificial Intelligence, Web Technologies, Natural Language Processing, Deep Learning

Durgapur, India — **National Institute of Technology Durgapur** — **August 2018 – June 2022**

- B.Tech. in Computer Science and Engineering. CGPA: 9.1/10
- Courses: Discrete Math, Data Structures, Computer Networks, OOP, DBMS, OS, Soft Computing, AI, ML, NLP, Image Processing

EXPERIENCE

Artificial Intelligence Researcher — **USC Information Sciences Institute** — **November 2022-Present**

- Developed a privacy-aware question-answering system for mental health risk assessment using Unified-QA architecture; anonymized training data using differential privacy with <1% accuracy tradeoff; wrote scripts to systemize training Language Models (with >300 M parameters) on multi GPU remote servers; paper accepted ACL BioNLP '23
- Built a novel Food Image to Recipe Generation pipeline in PyTorch that generates title, ingredients, and recipe (with customization using prompts) in both natural language and code (symbolic triples) using T5, BLIP, and GPT language models; paper showcasing improvement over previous SOTA by ~10 % under review at IEEE/CVF WACV '24
- Automated mining and visualizing data on course participation using Python, Selenium, BeautifulSoup, Plotly, and JnaaP; analyzing and projecting trends of course participation using machine learning

Research Intern — **Nanyang Technological University** — **May 2021 – July 2021**

- Lead authored a paper on Sea-Pix-GAN, a pix2pix GAN with a tailored U-Net generator and Patch-GAN discriminator addressing color and contrast challenges for underwater image enhancement
- Built the entire pipeline from scratch using Python, Tensorflow and Keras; showcased ample reconstruction in histogram analysis and an average improvement of 15-20 % across standard metrics such as PSNR, SSIM, and UIQM in benchmark against SOTA; awarded Certificate of Excellence by NTU

Research Intern — **CSIR-CMERI** — **April 2020 – July 2020**

- Built a Random Forest Classifier for intelligent smoke alarm, utilizing temperature, O_2, CO, and CO_2 sensor data from a Micro Controller Unit, improving upon traditional smoke alarms by 18 % less false positive rate
- Published and presented the paper on Intelligent Fire Detection at EWCIS 2020; received the Best Paper Award

PROJECTS

- **Deep Neural Networks from Scratch** (GitHub Link)**:** Designed components of MLP and CNN from scratch using NumPy. Implemented forward and backward passes of all the layers (Fully Connected, Conv2D, GeLU, MaxPool, and Dropout). Also, applied SGD and ADAM with cross-entropy loss, weight decay, L1 & L2 regularization
- **Hidden Markov Model for POS Tagging** (GitHub Link): Built HMM with Greedy and Viterbi Decoding from scratch in Python for POS tagging on the standard Penn Treebank dataset; achieved test accuracy of 92 % and 94 %
- **Yelp Business Search** (Live): Built a responsive Web App to search businesses, see details and reviews, and make reservations using Yelp APIs, NodeJS, Express, Angular, Bootstrap, and AJAX and deployed it on GCP
- **GO Game Agent** (GitHub Link)**:** Implemented an AI with heuristic minimax search and alpha-beta pruning that responds within a limited time to beat random, greedy, and aggressive agents built by TA on a 5x5 GO board
- **Genetic Algorithm for 3D Travelling Salesman Problem** (GitHub Link): Wrote a Genetic Algorithm with heuristics in selection, crossover, and mutation that outranked all TA agents and 80 % of student agents on Vocareum
- **Rural Education Monitoring** (Undergraduate Thesis): Built an android app in Java for classroom monitoring and data acquisition. Used Siamese Network of FaceNet for Face Recognition of students and MobileNet emotion labeling
- **WatchList** (Demo, APK, GitHub Link)**:** Built an android app using Flutter SDK and themoviedb API to discover movies/shows, watch trailers and make a personalized watchlist

PUBLICATIONS

- Chaurasia, Dhiraj and Chhikara, Prateek, Sea-Pix-Gan: Underwater Image Enhancement Using Adversarial Neural Network. Available at SSRN: http://dx.doi.org/10.2139/ssrn.4524938
- Chhikara, P., Pasupulety, U., Marshall, J., Chaurasia, D., \& Kumari, S. (2023). Privacy Aware Question-Answering System for Online Mental Health Risk Assessment. ArXiv, abs/2306.05652. https://aclanthology.org/2023.bionlp-1.18.pdf
- Chaurasia D., Shome S.K., Bhattacharjee P. (2021) Intelligent Fire Outbreak Detection in Wireless Sensor Networks. Lecture Notes in Electrical Engineering, vol 740. Springer, Singapore. https://doi.org/10.1007/978-981-33-6393-9_29

SKILLS

- **Technical Languages:** Python, C/C++, SQL, Java, Dart, HTML, CSS, JavaScript, TypeScript, MATLAB, Octave
- **Frameworks:** PyTorch, TensorFlow, HuggingFace, SciPy, NLTK, NumPy, Matplotlib Pandas, OpenCV, Angular, Express, Flask
- **Tools:** Firebase, AWS, GCP, REST API, JSON, Bootstrap, AJAX, Git/GitHub, Anaconda, Jupyter Notebook, Docker, Latex, Linux
- **Industry Knowledge:** Generative AI, Language Models, Deep Learning, Computer Vision, Natural Language Processing, Android