Gugan S Kathiresan

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US Citizen – Looking for Full Time Opportunities – May 2024 onwards.

GRADUATE EDUCATION

Northeastern University, Khoury College of Computer Sciences, Boston, MA — May 2024
Master of Science in Artificial Intelligence – Spec in Computer Vision and Machine Learning — GPA: 3.75/4
Relevant Courses: Machine Learning, Advanced Perception, Intro to Data Mgmt. & Processing, Natural Language Processing

TECHNICAL SKILLS

Languages	Python	Java	SQL	C++	R			
Libraries/S/w	PyTorch	Tensorflow	Keras	OpenCV	CUDA	Scikit-learn	AWS	Google Cloud Platform
	PostgreSQL	MySQL	MongoDB	Hadoop	Spark	Map Reduce	Web Scraping	

PROFESSIONAL EXPERIENCE

Khoury College of Computer Sciences, Northeastern University, Boston, MA — September 2023 – April 2024
- Teaching Assistant - DS3000 Foundations of Data Science

- Supported 200+ students in key topics – (data exploration, data cleaning, model interpretability, model optimization and hypothesis testing) through scheduled office hours, & programming assistance.

rStream Recycling LLC, Somerville, MA
- Part-time Data Analytics and Visualization Engineer — September 2023 – December 2023

- Key role in the success of the patent pending "AuditPRO", preparing monthly analytics reports, presentations.
- Created Streamlit dashboards for prototype analytics using pandas, matplotlib, AWS EC2 and S3 storage.

- Computer Vision/Machine Learning Software Engineering Co-Op Intern — May 2023 – September 2023

- Developed "AuditPRO" pilot @ UMass Amherst, a recycling auditing solution.
  (powered by multi-processing Pytorch computer vision scripts, AWS, NVIDIA Jetson)
- Devised upstream - downstream multi-level labelling scheme for real-time data collection and annotation.
- Fine-tuned SOTA segmentation RCNN and transformer models to 83% mIoU while experimenting on domain adaption to unfamiliar data and real-time inference.
  (Open mmlabs, detectron2, hugging face, AWS, Google Colab Pro)
- Explored hierarchical mask layering using SAM for 30+ waste labels based on form factor and material family.

College of Social Sciences and Hum., Northeastern University, Boston, MA — September 2022 - April 2023
- Teaching Assistant + Research Assistant-International Affairs, Global Governance

- Research Assistant – Produced multiple manuscripts addressing militarization of AI & algorithms in the context of international law (with Prof Denise Garcia) (Fall 22)
- Lead Teaching Assistant in the International Conflict and Negotiation course. (Spring 23)

QWK - The Convenience App, B2C Startup, Chennai, India — January 2022 - May 2022
- Data Science Intern, Founders Office

- Delivered DoD business insights (sales, acquisition costs, etc.) & exploratory data analysis for actionable predictions.
- Employed A/B testing to identify customer demographics for supervising marketing campaigns (110% sales growth)
- Extrapolated data from PostgreSQL database with Rest API integrations to Google Cloud Platform and Slack.
- Designed a regression-metric to improve delivery ETA reliability by 10% for real time updates in App.

RELEVANT PROJECTS

Design of an Ecommerce Platform for Perfume and Cosmetics — September 2023- December 2023
CS5110 - Intro to Data Mgt and Processing – Project | Northeastern University

- Constructed a MySQL database for an ecommerce equipped with variety of views, triggers, stored procedures, functions and established in third normal form.
- Developed a command line interface using the pymysql library for the user to access and use the ecommerce site.

Low Rank Adaptation (LoRA) on Deep Networks for Single-Image Super Resolution — September 2023- December 2023
CS7180 – Advanced Perception -Project | Northeastern University

- Explored the benefits of LoRA for Deep Networks like Latent Diffusion Models, Swin Transformers, and Conditional GANs.
- Evaluated performance on Image Super Resolution tasks, and how it fine-tunes on unknown aerial imagery datasets.

Analyzing the Contextual Performance of Machine Learning vs Transformers in Toxic Comment Classification — January 2023- April 2023
CS6140 – Machine Learning – Project | Northeastern University

- Compared and constructed common clustering algorithms and popular transformer architectures to classify multilingual toxic comments collected from social media.
- Evaluated the performance of KNN, random forest, XGBoost, RoBERTa models with a stacked configuration to support our claim that transformers, while computationally heavy, provide balanced and accurate classification results.

RESEARCH EXPERIENCE

Co-authored ~8 international publications in the field AI – DL applications (2019 – Present)

Google "Gugan Kathiresan Scholar" for paper links or visit - https://github.com/Gugan0905

"A Novel Two-staged Network for Skin Disease Detection using Atrous Residual Convolutional Networks"
Concurrency & Computation: Practice and Experience (2021 Impact factor: 1.831) (https://doi.org/10.1002/cpe.7834)

"A Beneficial Dual Transformation Approach in Steel Surface Defect Detection System"
ACM International Conference on Multimedia Retrieval 2021 (2020 Impact factor: 4.46) (https://doi.org/10.1145/3460426.3463666)

"DETECTORS++: The Robust Baseline for a Defect Detection System"
2021 IEEE ICCE Taiwan (2019 Impact factor: 1.29) (https://doi.org/10.1109/ICCE-TW52618.2021.9603063)

"AI for COVID-19 Detection from radiographs: Incisive analysis of state-of-the-art techniques, key challenges and future directions"
Innovation and Research in BioMedical Eng., Elsevier (Most downloaded articles) (2020 Impact factor: 1.856) (https://doi.org/10.1016/j.irbm.2021.07.002)

"Gaussian Dropout based stacked ensemble CNN for Classification of Breast Tumor in Ultrasound Images"
Innovation and Research in BioMedical Eng., Elsevier (2020 Impact factor: 1.856) (https://doi.org/10.1016/j.irbm.2021.10.002)

"Algorithms and Decision-Making In Military Artificial Intelligence"
Global Society, (https://doi.org/10.1080/13600826.2023.2273484)

"Disease detection in Rice leaves using transfer learning techniques"
International Conference on Innovative Technology for Sustainable Development-2021 + IOP - Journal of Physics: Conference Series (2020 Impact factor: 0.55) (https://doi.org/10.1088/1742-6596/1911/1/012004)

A modest IoT based smart parking system with business analytics integration.
International Conference on Robotics, Intelligent Automation & Control Technologies- 2021