AACQUILINE LINU VARGHESE

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SUMMARY

BTech Computer Science and Engineering student with expertise in Artificial Intelligence, Deep Learning, and Computer Vision. Proficient in Python, PyTorch, and OpenCV with hands-on experience in developing and training neural network models. Strong foundation in machine learning and data processing, recognized for being self-motivated, detail-oriented, and an effective team player. Aspiring to apply these skills to solve real-world challenges in AI-driven systems.

SKILLS SUMMARY

- **Languages:** Python, C/C++, Java, HTML/CSS, JavaScript
- **Frameworks & Libraries**: PyTorch, Scikit-learn, OpenCV, NumPy, Pandas, Matplotlib
- **Databases**: MySQL, Oracle
- **Platforms & Tools**: Git, GitHub, VS Code, Jupyter Notebook, Google Colab, Twilio API
- **Domains**: AI/ML, Deep Learning, Computer Vision, Operating Systems (Linux, Windows), Data Structure and Algorithms, Networking Basics
- **Soft Skills**: Problem Solving, Teamwork, Analytical Thinking, Continuous Learning

WORK EXPERIENCE

IEEE CIS SUMMER INTERN | NIT Calicut May 28th – June 27th,2025

Project: Document Image Denoising using Spatial Attention U-Net and Autoencoder

Key Contributions:

- Collected and pre-processed a dataset of 216 noisy-clean document image pairs, including grayscale conversion, normalization, resizing, and augmentation.
- Implemented two deep learning architectures (Autoencoder & SA-UNet) in PyTorch for denoising degraded documents containing stains, bleed-through, and artifacts.
- Integrated a Spatial Attention Module (SAM) in U-Net to enhance focus on noisy regions and improve visual clarity.
- Trained models using L1 Loss & Adam Optimizer and evaluated them with PSNR (Peak Signal-to-Noise Ratio) and visual quality analysis.
- Achieved PSNR improvement from 7.63 dB to 16.95 dB with Autoencoder, while SA-UNet delivered targeted noise suppression in challenging regions.
- Contributed by designing training/evaluation pipelines, benchmarking model performance, and documenting results with recommendations for future enhancements.

Skills Gained: Deep Learning, Neural Networks, PyTorch, Image Processing, Computer Vision, Research & Experimentation

MACHINE LEARNING INTERN March 9th – March 30th,2025

LBS Centre for Science and Technology

Key Contributions:

- Explored supervised and unsupervised learning techniques across multiple datasets.
- Worked on classification and regression problems, applying algorithms such as Decision Trees, KNN, Logistic Regression, and Clustering methods.
- Gained practical experience with Python libraries such as NumPy, Pandas, Matplotlib, and Scikit-learn for data preprocessing, visualization, and model building.
- Strengthened understanding of model evaluation metrics and comparative analysis of ML methods.

Skills Gained: Machine Learning, Supervised & Unsupervised Learning, Python, Data Analysis, Model Evaluation

PYTHON INTERN | R & Ee Forum November 2023- December 2023
Basics to Advanced
Key Contributions:

- Mastered Python fundamentals to advanced concepts, including NumPy, Matplotlib, and OOP principles.
- Gained hands-on training in Python data structures (lists, dictionaries, trees) and algorithmic problem-solving.
- Developed practical applications using data visualization (Matplotlib) and numerical computing (NumPy) libraries.

Skills Gained: Python Programming, NumPy, Matplotlib, Data Structures, Algorithm Design

PROJECTS

CROWD MONITORING AND ALERT SYSTEM | MINIPROJECT
Python, YOLOv11, OpenCV, Twilio API, MongoDB
Key Contributions:

- Developed an AI-powered crowd density analyzer using YOLOv11 for real-time person detection, achieving moderate accuracy in high-density scenarios.
- Implemented Gaussian kernel density mapping to calculate crowd density thresholds, triggering automated alerts via Twilio API (WhatsApp/email) when limits were exceeded.
- Designed a user-friendly dashboard (HTML/CSS) to visualize real-time heatmaps, historical trends, and alert logs.
- Optimized the backend with MongoDB for scalable data storage and retrieval, ensuring compliance with data privacy standards.
- Collaborated in a team of 4 to integrate OpenCV-based video processing and object tracking, reducing false positives

EDUCATION

Bachelor of Technology (B. Tech) in Computer Science & Engineering 2022-Pursuing

- LBS Institute of Technology for Women | CGPA: 8.51

Higher Secondary Education | Computer Science 2019-2021

- Percentage: 95.67%

SSLC

- Percentage: 96%

CERTIFICATIONS & ACHIEVEMENTS

- **NPTEL Cloud Computing (May 2025)** | Indian Institute of Technology, Kharagpur (IITK)
- **Google Cybersecurity Certification (March 2025)** | Network Security, Threats, Vulnerabilities, Assets
- **IBM SkillsBuild Winter Certification Program – Data Analytics** (January 2025)
- **Best Project Award | Arduino Simulation using TinkerCard** | IEEE RAS SBC LBSITW (April 2023)

LANGUAGES

- English
- Hindi
- Malayalam