JEGADIT SAKTHI SARAVANAN

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Education

University of Illinois at Chicago	**Aug 2024 - May 2026**
MS in Computer Science	*GPA: 4.0/4.0*
Amrita Vishwa Vidyapeetham, Coimbatore, India	**July 2020 - June 2024**
B.Tech in Computer Science and Engineering - First Class with Distinction	*GPA: 8.19/10*

Experience

Club Lead, Technical Lead of Robotics & AI Research team | Volunteering   **May 2022 – June 2024**
Deep Water Marine Club (DWMC) | Website
- Designed and developed the Autonomous Underwater Vehicle (AUV) "Sea Dragon", integrating advanced computer vision, embedded systems, and control algorithms for real-time underwater exploration and navigation.
- Engineered the AGAKF algorithm (Adaptive Genetic Algorithm-aided Kalman Filter), achieving 95% noise reduction and 87% improvement in navigation accuracy, significantly enhancing performance in dynamic underwater environments.
- Designed and executed automated testing pipelines on MATLAB-based simulation framework, replicating over 100 unique underwater scenarios, to evaluate the integration of AI algorithms within the AUV and validate system performance.

Machine Learning Engineer Intern   **Nov 2022 – March 2023**
TIFAC-CORE in Cyber Security | Website
- Designed a Deep Learning-based classification model to distinguish between encrypted and compressed data streams, achieving 92% classification accuracy, enabling faster detection of data anomalies and development of advanced mitigation strategies for legacy systems.
- Reduced vulnerability assessment time by 45% through custom automation pipelines, optimizing detection protocols to improve system resilience.
- Reverse-engineered the CVE-2019-11932 vulnerability, replicating it in a secure virtual environment to analyze exploit mechanisms and develop countermeasures for legacy software vulnerabilities.

Publications

- **Saravanan, J. S.** & Mahadevan, A. (2023). AI based parameter estimation of ML model using Hybrid of Genetic Algorithm and Simulated Annealing. | Paper | Code | PyPi Package

Selected Projects

NeuroVision: High-Precision 3D Medical Imaging on Mobile Devices   **Oct 2024 - Present**
- Developing a mobile application to transform medical imaging by combining Neural Radiance Fields (NeRF) and Neural Implicit Surfaces (NeuS) for volumetric 3D reconstructions, using Structure-from-Motion (SfM) to extract precise camera poses and sparse 3D point clouds from 2D image sequences.
- Optimizing real-time performance through memory-efficient neural rendering, GPU acceleration, addressing computational challenges on resource-constrained devices like smartphones to democratize medical imaging diagnostics.

FotoFind: Image Retrieval with Advanced CV & NLP | GitHub   **Aug 2024 - Nov 2024**
- Designed and deployed a multi-modal pipeline integrating object detection (YOLO, Faster-RCNN), vision-language models (ViT-GPT2, BLIP), and OCR (EasyOCR) for automated metadata extraction from images.
- Achieved 90%+ accuracy in metadata generation & < 0.4 sec search latency, optimized for scaling to millions of images.
- Utilized advanced text-to-image models (DALL·E, Stable Diffusion) to generate synthetic datasets for rigorous stress and edge case testing, ensuring robust system performance under diverse, extreme conditions.

Optimized Chain-of-Thought Reasoning in LLMs with Speculative Decoding | GitHub   **Aug 2024 - Nov 2024**
- Developed a dual-model speculative decoding framework, reducing inference latency by up to 3.2x with token acceptance rates exceeding 85% across benchmarks like GSM8K and MultiArith with the LLaMA-8B & the LLaMA-3B models.
- Automated training data synthesis for edge-case testing using GANs (Generative Adversarial Networks), significantly expanding test coverage and enhancing the robustness of the reasoning pipeline.

Technical Skills

Deep Learning: TensorFlow & Keras, PyTorch, Scikit-learn, Numpy, Scipy, Pandas, Matplotlib, Pillow, OpenCV
Languages: Python, C++, Java, GoLang, C, JavaScript, Bash Scripting, SQL
Cloud and Development: AWS, Google Cloud Platform, Virtual Machines, MATLAB, NGROK, NGINX, GIT, Docker, Flask, Django, Node.js, React.js Android Studio, ApacheWeb Server, HTML, CSS, JDBC/ODBC, Bootstrap, REST, Jira