KESHAV BHARADWAJ VAIDYANATHAN

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TECHNICAL SKILLS

- **Programming Languages** - Python, C/C++, R, SQL, Shell scripting, HTML
- **Tools** - AWS, Postgres, MongoDB, Docker, Elastic Search, Git, CI/CD, OpenVINO, TensorRT, Apache Spark, Kubernetes
- **Packages** - NumPy, Pandas, Flask, Tkinter, PyTorch, PyTorch-lightning, OpenCV, Keras, SciKit, NLTK, Dash, OpenGL

WORK EXPERIENCE

Silicon Synapse Lab **Sep 23 – Present**

Computer Vision Research Assistant | YOLO, AutoEncoder, Transformer, OpenVINO, TensorRT, YOSO, mask2former

- Integrated real-time scene segmentation and object detection into the robot's perception domain. Conducted thorough data analysis, and preprocessed RGB data, achieving a **0.78** IoU for the ground class. Currently implementing instance segmentation models.
- Accelerated segmentation models by implementing network quantization for NVIDIA Jetson, resulting in a **2x** reduction in inference time and memory size.

Abiomed Inc (Johnson & Johnson) **Feb 23 – Sept 23**

Data Scientist | Time-Series, LSTM, RNN, Transformer, Signal Processing, Data Visualization, Data Analysis, Regression

- Created cardiac output prediction models for patients on mechanical circulatory support, utilizing Apache Spark to extract high-frequency time-series device data and managed to get a significant **5.2%** reduction in error rates.
- Collaborated on research and implemented a Domain-Adversarial Neural Network (DANN) to forecast aortic pressure in different patient cohorts, leveraging computer simulations to generate extensive data with a **0.82** RMSE loss.
- Analyzed and optimized the predicted probabilities of a Deep Neural Network (DNN) model for right heart failure prediction, improving the model's Brier skill score by elevating the threshold from 0.23 to 0.5, resulting in clearer classification outcomes.

Mad Street Den **Dec 20 – Jul 21**

Machine Learning Engineer | Recommendation System, Docker, SQL, CNN, Classification, AWS, Elastic-search, NLP, OCR

- Engineered ML models for tag generation in an Elastic search-driven recommendation system, fine-tuning scoring functions for optimization and achieving a **67%** match for the top 1 and an **82%** match for the top 5 recommendations.
- Developed and implemented advanced machine learning models, such as Seq2Seq LSTM OCR and CNN for text classification, deployed on Kubernetes, resulting in a substantial monthly cost reduction of **$10,000** for OCR operations.
- Designed and deployed data processing pipelines and tag storage across Redshift, S3, Dynamo, and Redis databases and optimized by eliminating redundant operations, resulting in a **15%** reduction in response time.

PATENTS

Q-CerGen (Quick Certificate Generator) | *Flask, OpenCV, Tkinter, WebGL, Brython, HTML, Python* **Mar 21**

- Devised a novel application for the swift generation of over **3000**+ E-certificates/ E-trophies with a UI and a website.

ADAM ***(Automatic Disassemble and Assemble Machine) |*** *Python, OpenGL, OpenCV, SIFT algorithm* **Jun 21**

- Directed the brainstorming, design, and development of a prototype robotic pick-and-place arm proficient in disassembling and reassembling patterns and crafting a user-friendly 3D interface for pattern customization.

ACADEMIC PROJECTS

SegMask for 3D Object Detection, Advanced Computer Vision *|Autonomous driving, PSPNet model* **Sept 22 – Dec 22**

- Pioneered a novel approach on Frustum-PointPillars by replacing Gaussian masks with segmentation masks for multi-stage sensor fusion with RGB and LiDAR data, leading to a **3%** enhancement on the KITTI-hard dataset for 3D object detection.

Question Answering System, Natural Language Processing | *LLM - BERT, LSTM, RNN* **Jan 22 – Apr 22**

- Obtained a **63.5%** accuracy and **66.7** F1-score with the baseline Bi-Directional LSTM model on SQuAD2.0, and a **77.3%** accuracy with Distilled BERT, yielding an **85.4** F1-score for question-answering tasks.

Visual Question Answering, Deep Learning | *Transformers, LxMERT, VGG, LSTM, CNN, Multimodal* **Jan 22 – Apr 22**

- Achieved **57%** accuracy with the baseline LSTM Question + norm image model with VGG image embedding and **70.68%** accuracy with the transformer-based LxMERT model for visual question answering on the VQA dataset.

EDUCATION

Master of Science in Computer Engineering, Northeastern University **Dec 23**

Specialization in Computer Vision, Machine Learning and Algorithms **GPA: 3.88**

Courses: Machine Learning, Deep Learning, Natural Language Processing, DBMS, Computer Vision, Assistive Robotics.

Bachelor of Engineering in Electronics and Communication, Visvesvaraya Technological University **Aug 20**

Directed Falcon's technical team, and organized project expos, seminars, national conferences, and workshops. **GPA: 8.43**