

JESHWANTH CHALLAGUNDLA

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EDUCATION

M.S. Electrical Engineering

University of Texas at Arlington, Arlington, Texas.

Aug 22, 2013 - May 15, 2015

Received Image Processing and Neural Network Lab fellowship

Thesis: [Adaptive Multiple Optimal Learning Factors for Neural Network Training](#)

- Utilized second-order optimization to compute multiple learning factors, each tailored to a specific group of weights in training a multi-layer perceptron, improving training effectiveness.
- Adaptively adjusted the number of learning factors at each epoch to optimize computational efficiency, ensuring dynamic resource utilization.

B. Tech. Electrical and Electronics Engineering

Pondicherry Engineering College, Puducherry, India.

Jul 15, 2009 - May 15, 2013

WORK EXPERIENCE

Senior Machine Learning Software Engineer

Google, Mountain View, CA

Dec 02, 2019 - Present

Gemini

- Led the development and launch of Gemini advanced [data analysis feature](#) and seamlessly integrated with Google Workspace and other tools.
- Enhanced model-generated insights by improving the quality and accuracy of code-generated graphs, delivering more actionable data visualizations.
- Iteratively improved model performance across diverse tasks through fine-tuning, reinforcement learning (RL), and prompt engineering, leading to more robust and adaptive models.
- Architected a scalable infrastructure for agent orchestration, enabling dynamic prompting and multi-step planning, which significantly optimized task execution and model flexibility.

Google Assistant

- Developed BERT-based dual-encoder models to enhance contact matching accuracy for Google Assistant, optimizing communication-related queries like calling and messaging.
- Designed and implemented a comprehensive user profile platform that tracks all user interactions with Google Assistant and computes personalization features that power model training and serving for tailored user experiences.

Autonomous Driving Software Engineer

General Motors, Warren, MI

May 01, 2017 - Nov 30, 2019

Collaboration with Cruise (Perception and Localization)

- Developed a lane edge registration module that aligns perception lane edges with map lane edges using a weighted ICP algorithm, improving accuracy in autonomous vehicle navigation.
- Built a perception-map association module to reliably associate landmarks detected in perception with corresponding map landmarks, enhancing map-based localization.
- Implemented and benchmarked deep neural networks for pixel-wise scene segmentation on public and internal datasets, optimizing performance on GTX 1080 Ti GPUs.
- Developed a web tool using roslibjs to monitor the status of autonomous vehicle sensors and modules in real-time, improving system visibility and diagnostics.

Senior Software Engineer

Magna, Auburn Hills, MI

Feb 8, 2016 - Apr 30, 2017

- Benchmarked an in-house computer vision chip against Mobileye EyeQ3, providing critical performance comparisons for advanced driver assistance systems (ADAS).
- Developed a closed-loop test system to evaluate front camera module features, including lane-keeping assist and collision mitigation braking, ensuring robust ADAS functionality.
- Created automated test scripts for comprehensive testing of the Front Camera Module, streamlining validation processes and improving testing efficiency.
- Developed a Python-based SPI sniffer library using the Beagle SPI Protocol Analyzer API, enabling integration with dSpace AutomationDesk for enhanced testing automation.
- Automated application and system-level test cases within dSpace AutomationDesk, improving the efficiency and accuracy of ADAS validation workflows.
- Developed an image comparison library for rear-view camera ECU overlay testing, designed for use within the LabVIEW environment, enhancing visual testing capabilities.

Embedded Software Engineer

Jun 1, 2015 - Feb 7, 2016

UHV Technologies Inc., Fort Worth, TX

Aluminum Alloy Sorter using X-Ray Fluorescence, ARPA-E

- Increased the accuracy of an aluminum alloy sorting system by 12% by developing machine learning models to classify X-ray fluorescence spectrum data of various aluminum alloys.
- Developed a vision system to estimate the size of aluminum pieces in real-time as they move along a conveyor belt, enhancing sorting precision.
- Automated the sorting process using LABVIEW and NI-6008, streamlining operations and improving the overall efficiency of the system.

Engineering Intern

Sep 10, 2014 - May 15, 2015

UHV Technologies Inc., Fort Worth, TX

Research Publications

Author:

- "Multiple Gain Adaptations for Improved Neural Networks Training"
- "State-Based Dynamic Graph with Breadth-First Progression for Autonomous Robots"
- "Adaptive Multiple Optimal Learning Factors for Neural Network Training"
- "Second Order Neural Network Optimization: Meta Analysis" (in progress)
- "LLMs as Master Forgers: Generating Synthetic Time Series Data for Manufacturing" (in progress)

Partial Contributor:

- "Gemini: A Family of Highly Capable Multimodal Models"

- "Gemini 1.5: Unlocking Multimodal Understanding Across Millions of Tokens of Context"

Reviewer for prestigious machine learning conferences and journals:

- Neural Information Processing Systems (NeurIPS)
- Transactions on Machine Learning Research (TMLR)
- IEEE Transactions on Neural Networks and Learning Systems (TNNLS)
- IEEE Transactions on Artificial Intelligence (TAI)

SKILLS & SUMMARY

Programming: C++, Python, Java, SQL, Go, Dart

Frameworks|Platforms: Pytorch, Tensorflow, ROS, Google Cloud

Areas of Interest: LLMs, Agentic workflows, Deep learning, Computer Vision