Giridhar Narasapura Rajagopalaiah
Los Angeles, California

Dear Viewer,

I am writing to share with you my extensive research experience and accomplishments in the field of computer science, particularly in the areas of Artificial Intelligence and Machine Learning. As a dedicated and enthusiastic researcher, I have had the privilege of working on cutting-edge projects at renowned institutions, contributing to the advancement of technology and knowledge in the process.

Education:
I completed my Master of Science in Computer Science with a specialization in Artificial Intelligence at the University of Southern California (USC) in December 2023. Prior to that, I earned my Bachelor of Engineering in Computer Science from Nitte Meenakshi Institute of Technology in Bengaluru, India.

Skills Summary:
My skill set encompasses a wide range of programming languages, frameworks, and technologies, including C, C++, Python, CUDA, SQL, cuDNN, OpenCV, PyQT, Hadoop, PyTorch, TensorFlow, TensorRT, OpenVINO, NVIDIA Nsight, Hugging Face, Digital Image Processing, Computer Vision, Machine Learning, Deep Learning, Natural Language Processing, Generative AI, Transformers, and Large Language Models.

Research Experience:

1. **Postgraduate Researcher** - Yale University, New Haven, CT (Aug 2023 - Present)

Designed and developed a language model that achieved prediction of speakers' lexical attributes. Clean and preprocess authentic clinical oncology encounter data for model training. Evaluate and refine model's performance to ensure its resilience and reliability across diverse applications.

- Skillset: Large Language Models, Natural Language Processing, Clinical Texts
- Created and optimized an advanced language model by employing cutting-edge techniques to excel in accurate speaker prediction and automatic speech recognition.
- Boosted performance and accuracy of speaker recognition from 0.73 to 0.79 by fine-tuning BERT through architectural modifications and precise tuning.
- Increased Jaro similarity from 0.66 to 0.78 and improved Automatic Speech Recognition (ASR) performance in challenging conditions by leveraging voice denoising algorithms, spectral grating, and adaptive filtering techniques.

2. **Applied Scientist Intern** - Amazon, San Diego, CA (May 2023 - Aug 2023)

- Skillset: Continual Learning, Tabular Data
- Engineered an efficient abuse prevention system by leveraging Memory Relay and Regularization-based Continual Learning, contributing to a safer online environment.
- Pioneered an attention-based Continual Learning approach, achieving a remarkable 2% reduction in forgetting compared to state-of-the-art methods.
- Boosted the performance of XGBoost by an impressive 1% AUC through the incorporation of memory-replay continual learning techniques.

3. **Graduate Research Associate** - University of Southern California, Los Angeles, CA (March 2022 - May 2023)

Engineered an automated speech and language processing pipeline employing RNN-transducers to perform speaker diarization. Ensured production of superior-quality MRI datasets and facilitated precise data analysis through meticulous fine-tuning of generative AI models.

- Skillset: Computer Vision, Generative AI, Multi-Modal, MRI Data
- Led creation of a 3D Cycle GAN alongside an attention-gated transformer for unpaired image-to-image translation.
- Enhanced GANs for the purpose of 3D MRI-to-MRI data harmonization and improved consistency across a range of scanning protocols.
- Increased predictive accuracy within complex medical datasets by refining multi-modal classification models to amplify the analysis of 3D MRI and numerical data.
- Utilized CycleGAN to elevate the Signal-to-Noise ratio by 32%, resulting in improved 3D MRI data consistency across both DTI and T1 protocols.
- Improved classification precision by 0.14, while seamlessly integrating 3D MRI scans (DTI) and numerical data (Habel) using a customized multi-modal deep learning framework.

4. **Machine Learning Engineer** - Philips Research, Bengaluru, India (Aug 2018 - Dec 2021)

Executed an in-depth research initiative, resulting in the creation of real-time pose estimation and semantic segmentation networks to track fetal heart motion during both diastole and systole stages. Made substantial contributions to successful transition of deep learning algorithms into the ultrasound business domain. Played a pivotal role in submission of four patents within the framework of Koninklijke Philips N. V.

- Skillset: Computer Vision, Deep Learning, Ultrasound Medical Imaging
- Significantly improved fetal heart view plane classification accuracy from 69% to a remarkable 84% through fine-tuning HRNet.

- Leveraged the power of TensorRT on NVIDIA P2000 for an impressive 5x GPU acceleration in deep neural network performance.
- Demonstrated a remarkable 3x acceleration in deep learning model performance on Intel NUC CPU using OpenVINO.
- Led extensive research to develop real-time pose estimation and semantic segmentation networks for precise fetal heart tracking during systole and diastole phases.

Publications

- Soumabha Bhowmick, Giridhar NR, Karthik Krishnan, Seth Subhendu, Celine Firtion, Pallavi Vajinepalli. eFtus - An early first Trimester Ultrasound scan assistance. Conference: Philips Research Global. Publisher: OCUPAI 2021.
- Karthik Krishnan, Giridhar NR, Celine Firtion, Pallavi Vajinepalli. Real-Time Deep Pose Estimation in Ultrasound. Conference: Philips Research Global. Publisher: OCUPAI 2020.
- Giridhar NR, Aniketh Manjunath, Jharna Majumdar. Modelling Fade Transition in a video using Texture Methods. Conference: Cybernetics, Cognition and Machine Learning Applications - Proceedings of ICCCMLA 2019. Publisher: Springer Singapore
- Giridhar NR, Gagan PE, Jharna Majumdar. Autonomous Mobile Robot Navigation on Identifying Road Signs using ANN. Conference: 2019 10th International Conference on Computing, Communication and Networking Technologies (ICCCNT - IIT Kanpur 2019). Publisher: IEEE
- Aniketh Manjunath, Giridhar NR, Jharna Majumdar. Optical Flow for Detection of Transitions in Video, Face and Facial Expression. Conference: Intelligent Computing: Proceedings of the 2018 Computing Conference (SAI - London, UK). Publisher: Springer, Cham
- Sudip Gupta, Giridhar NR, Jharna Majumdar. Human Tracking by a Mobile Robot in Low Illumination Environment. Conference: International Conference on Circuits, Control, Communication and Computing (I4C - 2018). Publisher: IEEE

Patents (Filed by Koninklijke Philips N. V)

- Methods for Guided 3D ultrasound acquisition using Spatio-Temporal Image Correlation (App no: PCT/EP2021/081925)
- Automatic Intelligent Visualization and Interaction using Real Time View Plane Classification and Pose Estimation (App no: PCT/EP2021/080229)
- Automating Localization and Estimation of Heartbeat in First Trimester Ultrasound Scans (App no: PCT/EP2022/066933)
- AI Based Approach to improve Ultrasound Image Quality (App no: 2020ID01990)

Honors and Awards:

My dedication and contributions have been recognized with several prestigious awards:

- Oct' 2021: Start Startup Award from Ramaiah Evolute for 'Postura.'
- June 2020: Individual Award (Philips) – Acknowledgment for boosting the accuracy of an algorithm from 69% to 84%.
- May 2019: Individual Award (Philips) – Recognition for expeditiously transitioning wAssist-AI from a research prototype to a product.
- April 2018: DRDO: DRUSE Design and Development of Human Tracking Mobile Robot for Defense Application. Ranked among the top 10 teams out of 15,000 teams to represent South India.
- December 2016: Nokia Innovation Day (Bangalore, India) - Modern Traffic Management System. Ranked among the top 2 teams out of 850 teams.

Copyrights:

I hold copyrights for my work in "Modelling of Transitions in Video Using Textures," (Registration Number - SW-14707/2017) granted by the Government of India.

Summary:

Highly skilled and results-driven professional with strong background in designing, developing, and implementing cutting-edge machine learning solutions. Proficient in conducting in-depth research, applying scientific principles, and leveraging advanced algorithms and data-driven insights to solve complex business problems and real-world challenges. Expertise in deep learning, applied natural language processing, operating systems, digital image processing, and robotics. Experienced in model development, training, and optimization, with proven track record of translating theoretical concepts into practical applications. Skilled in collaborating with cross-functional teams and staying updated on latest advancements in the field. Ability to drive innovation and deliver tangible results in the realm of artificial intelligence.

In conclusion, my journey as a researcher has equipped me with a diverse skill set and a track record of delivering impactful results. I am passionate about pushing the boundaries of AI and machine learning and look forward to contributing further to the field in the future.

Thank you for considering my research experience, and I am eager to discuss potential opportunities for collaboration or employment.

Sincerely,

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