Yixiang Gao, PhD, Electrical and Computer Engineering

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PROFESSIONAL SUMMARY

AI/ML Researcher with a Ph.D. in Electrical and Computer Engineering from the University of Missouri - Columbia. Specialized in fostering interdisciplinary collaborations, notably with speech and language pathologists, enhancing the integration of advanced AI methodologies in clinical settings. Actively engaged in two NIH-funded projects (R15, R01), contributing to significant advancements in the field. Published extensively across engineering and clinical platforms, including EMBC, CEC, AQL, ICVPB, and in peer-reviewed journals such as Applied Sciences. Exhibits profound expertise in deep learning, computer vision, robotics and pattern recognition, with a strong commitment to the open-source AI community. Seeking to leverage extensive AI/ML expertise to address complex real-world challenges and drive innovation in technology application.

TECHNICAL SKILLS

Programming Languages: Python	, C/C++/CUDA, Matlab, HTML	
Libraries: pytorch, tinygrad, scikit-	learn, transformers, ultralytics, mmdet, ROS, ONNX	
Experienced Models: SVM, GA, MLI	P, CNN, RNN, transformers, ViT, DETR, YOLOs, Llama	
MLOps and API Tools: Git, Docker,	Kubernetes, Github Actions for CI/CD	
Operating Systems: Linux(preferre	ed), Windows	
Languages: English, Chinese		
Education		
University of Missouri - Columbia University of Missouri - Columbia University of Missouri - Columbia	Ph.D in Electrical and Computer Science BS in Electrical Engineering BS in Computer Engineering	2017 – Current (Expected July 2024) 2014 – 2017 2014 – 2017
Experience		
Graduate Research Assistant Unive	rsity of Missouri - Columbia ViGIR Lab	2017 – Current (Expected July 2024)
• PhD Thesis: Confounded prediction	is in machine learning	
 Detect, quantify, and mitigate co 	nfounding factors in machine learning and deep lea	rning models.
Student Investigator for NIH R01DC	018026	2019 – Current
 Continuation study following the Developed new data collection p Published research on confound (AQL 2021/2023, CEC 2023, ICVPE) 	e previous NIH R15 project. rotocol and classification pipeline for both sEMG and ing factors in sEMG pattern recognition for voice pat 3 2024).	d fMRI data using pytorch and Matlab. nology
• Student Investigator for NIH R15DC	015335	2017 - 2019
 Led the development of machine Published pioneering research o (AQL 2017/2019, EMBC 2018, App 	e learning classification/clustering study using pytho n the applications of machine learning techniques ir llied Sciences).	n with scikit-learn and pytorch. voice pathology
Other projects		
• SpotMicro University of Missouri - Columbia ViGIR Lab		2022 - 2023
 An open-source quadruped robo 	t for the MU Robotics club. Operated by a Raspberry	Pi 4 and integrated with ROS.
Object Detection and Pose Estimati	on using Embedded Devices University of Missouri -	Columbia ViGIR Lab 2019
 Applied YOLO on a Raspberry Pi (SSCI 2019). 	3 with stereo-vision cameras for object detection and	d pose estimation.
Graduate Research Assistant Unive	rsity of Missouri - Columbia	2017 - 2019
Microprocessor Engineering		

• Software Design in C and C++

PUBLICATIONS

- [1] R. Farag, P. Upadhyay, **Yixiang, Gao**, *et al.*, "COVID-19 detection from pulmonary CT scans using a novel efficientnet with attention mechanism," in *The IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPRW)*, (Accepted), 2024.
- [2] Yixiang, Gao, G. N. DeSouza, M. Berardi, and M. Dietrich, "Voice sEMG classification of sentences for vocal fatigue detection using GA-SVM for confounder," in 13th International Conference on Voice Physiology and Biomechanics (ICVPB), (Accepted), 2024.
- [3] **Yixiang, Gao**, M. Berardi, M. Dietrich, and G. N. DeSouza, "Feature adaptation with GA-SVM for confounding removal an application on vocal fatigue detection using semg classification," in *The 15th Advances in Quantitative Laryngology, Voice and Speech Research (AQL)*, 2023.
- [4] **Yixiang, Gao**, M. Berardi, M. Dietrich, and G. N. DeSouza, "Removal of confounding factors using GA-SVM feature adaptation: Application on detection of vocal fatigue thru semg classification," in *IEEE 2023 Congress on Evolutionary Computation (CEC)*, 2023.
- [5] **Yixiang, Gao**, M. Dietrich, and G. N. DeSouza, "Classification of vocal fatigue using neck sEMG with leave-one-subject-out testing," in *The 14th Advances in Quantitative Laryngology, Voice and Speech Research (AQL)*, 2021.
- [6] **Yixiang, Gao**, M. Dietrich, and G. N. DeSouza, "Classification of vocal fatigue using sEMG: Data imbalance, normalization, and the role of vocal fatigue index scores," in *Applied Sciences*, vol. 11, 2021.
- [7] **Yixiang, Gao**, M. Dietrich, and G. N. DeSouza, "Explore voice production variability through neck semg clustering challenge for accurate labeling of vocal fatigue," in *The 14th Advances in Quantitative Laryngology, Voice and Speech Research (AQL)*, 2021.
- [8] J. Demby's, **Yixiang, Gao**, and G. N. DeSouza, "A study on solving the inverse kinematics of serial robots using artificial neural network and fuzzy neural network," in *2019 IEEE International Conference on Fuzzy Systems (FUZZ-IEEE)*, 2019.
- [9] J. Demby's, **Yixiang, Gao**, A. Shafiekhani, and G. N. DeSouza, "Object detection and pose estimation using CNN in embedded hardware for assistive technology," in *2019 IEEE Symposium Series on Computational Intelligence (SSCI)*, 2019.
- [10] M. Dietrich, E. Tippit, A. Walker, M. Pfeiffer, **Yixiang, Gao**, and G. N. DeSouza, "Relative fundamental frequency during vocal loading and relationships with laryngeal muscular patterns," The 13th Pan-European Voice Conference, 2019.
- [11] M. Dietrich, **Yixiang, Gao**, and G. N. DeSouza, "Extralaryngeal surface emg features that distinguish between those with and without elevated scores on the vocal fatigue index," The Fall Voice Conference, 2019.
- [12] Yixiang, Gao, M. Dietrich, M. Pfeiffier, A. Walker, and G. N. DeSouza, "Classification of vocal gestures extracted from quasi-daily sentences to detect vocal fatigue," The 13th Advances in Quantitative Laryngology, Voice and Speech Research (AQL), 2019.
- [13] **Yixiang, Gao**, M. Dietrich, M. Pfeiffer, and G. N. DeSouza, "Classification of sEMG signals for the detection of vocal fatigue based on VFI scores," in *2018 40th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, 2018.
- [14] **Yixiang, Gao**, M. Pfeiffier, M. Dietrich, and G. N. DeSouza, "Classification of neck surface EMG signals for the early detection of vocal dysfunction," The 12th Advances in Quantitative Laryngology, Voice and Speech Research (AQL), 2017.

OTHER ACTIVITIES

academic paper reviews: EMBC2019/2020/2021, CEC2023, Applied Sciences, TAI **open-source contributions:** tinygrad, transformers