

Yixiang Gao

PhD, Electrical and Computer Engineering

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PROFESSIONAL SUMMARY

AI/ML researcher with a Ph.D in Electrical Engineering and Computer Science, distinguished for collaborative research in a cross-disciplinary team and independently delivering meaningful results that lead to publications. Experienced in research topics such as deep learning, computer vision, robotics, and pattern recognition. Proud contributor of the open source AI community and believing in the democratization of AI from software to hardware. Actively engaged in the development of large language models and vision-language models.

TECHNICAL SKILLS

Languages : Python, CUDA/C/C++, Matlab, HTML

Libraries : pytorch, scikit-learn, tinygrad, transformers, ultralytics, mmdet, ROS, ONNX

DevOps and API Tools : Git, Docker, Kubernetes, Github Actions

Languages : English, Chinese

Research : Deep Learning, Computer Vision, Object Recognition, Robotics, Speech Processing, sEMG Pattern Recognition, Machine Learning on Embedded Devices

EXPERIENCE

Graduate Research Assistant | University of Missouri - Columbia

July 2017 – (Expected) July 2024

- Thesis: Confounded predictions in machine learning - detect, quantify, and mitigate confounding factors in machine learning and deep learning models.
- Built deep learning machine learning tools to analyze voice acoustic signals, sEMG, and fMRI images to understand neurological and biological causes for muscle tension voice disorders
- Developed the data collection protocol, assembled the hardware, and built the software for this study of early stage vocal fatigue detection using sEMG signals. Later developed classifiers such as SVM, MLP, and CNN to detect vocal fatigue from collected data.
- Built the first iteration of SpotMicro - an open-source quadruped robot for the Robotics club. Integrated the hardware with ROS kinetic operated on a Raspberry Pi 4.

Graduate Teaching Assistant | University of Missouri - Columbia

July 2017 – March 2019

- Microprocessor Engineering
- Software Design in C and C++

EDUCATION

University of Missouri - Columbia

Ph.D in Electrical and Computer Science

July 2017 – (Expected) July 2024

University of Missouri - Columbia

BS in Electrical Engineering

Jan 2014 – May 2017

University of Missouri - Columbia

BS in Computer Engineering

Jan 2014 – May 2017

PUBLICATIONS

- [1] R. Farag, P. Upadhyay, Y. 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)*, 2024 (Accepted).
- [2] Y. 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)*, 2024 (Accepted).
- [3] Y. 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] Y. 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] Y. 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] Y. 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] Y. 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, Y. 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, Y. 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, Y. 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.
- [11] M. Dietrich, E. Tippit, A. Walker, M. Pfeiffer, Y. Gao, and G. N. DeSouza, "Relative fundamental frequency during vocal loading and relationships with laryngeal muscular patterns," *The 13th Pan-European Voice Conference*, 2019.
- [12] Y. Gao, M. Dietrich, M. Pfeiffer, 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] Y. 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] Y. Gao, M. Pfeiffer, 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.