Yixiang Gao, Ph.D. Candidate

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Education

2016 – · · · · **Ph.D. Electrical and Computer Engineering,** University of Missouri - Columbia.
Thesis: Confounded predictions in machine learning

2012 – 2016 **B.S. Computer Engineering,** University of Missouri - Columbia.
B.S. Electrical Engineering, University of Missouri - Columbia.

Skills

Research Computer Vision, Machine Learning, Robotics, Bias Detection and Mitigation

Coding Python, MATLAB, HTML, C, C++

Languages English, Chinese.

Experience

2016 – · · · · **Graduate Research Assistant,** Vision-Guided and Intelligent Robotics Laboratory

- Neurobiological and Psychobiological Signatures of Vocal Effort in Early Career Teachers
  *Build machine learning tools to analysis voice acoustic signals, sEMG, and fMRI to understand neurological and biological causes for muscle tension voice disorders. (**Ongoing**)*
- Spotmicro a 3D-printed Robotic Dog
  *Help Build the first iteration of spotmicro for MU Robotics club. Create a platform to help undergraduate and graduate students to learn, practice what they have learned in class and have fun. (**Ongoing**)*
- 3D-Reconstruction of Cow using Kinect
  Built a 3D reconstruction pipeline to register depth point cloud from 9 kinect sensors that were mounted around a cage where a cow can walk in to be scanned.
- Object Dection and Pose Estimation using Embedded Devices
  Deployed YOLO algorithm on a Raspberry Pi with two stereo cameras for object detection and pose estimation and produced comparable results to state-of-art deep learning pose estimation model.
- Neck Surface EMG Signals for the Early Detection of Vocal Fatigue in Student Teachers
  Established the data collection protocol (hardware and software) for the study. Built classifiers such as SVM, CNN to detect vocal fatigue from collected data.

Research Publications

Journal Articles

1. **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," *Applied Sciences*, vol. 11, 2021.

Conference Proceedings

1. **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) [**Accepted**]*, 2023.
2. 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.

3. 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.

4. **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.

Selected Conference Presentations

1. **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," The 15th Advances in Quantitative Laryngology, Voice and Speech Research (AQL), 2023.

2. **Y. Gao**, M. Dietrich, and G. N. DeSouza, "Classification of vocal fatigue using neck semg with leave-one-subject-out testing," The 14th Advances in Quantitative Laryngology, Voice and Speech Research (AQL), 2021.

3. **Y. Gao**, M. Dietrich, and G. N. DeSouza, "Explore voice production variability through neck semg clustering - challenge for accurate labeling of vocal fatigue," The 14th Advances in Quantitative Laryngology, Voice and Speech Research (AQL), 2021.

4. **Y. 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.

5. **Y. 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.