Hudanyun Sheng

Email: hudanyun.sheng@outlook.com | Tel: +1 (352) 281-3829 | LinkedIn: https://www.linkedin.com/in/hudanyunsheng/

EDUCATION

University of Florida - *M.S. in Electrical and Computer Engineering (GPA: 3.86/4), December 2019*

Master thesis: Switchgrass Genotype Classification using Hyperspectral Imagery

University of Florida - *M.S. in Industrial and Systems Engineering (GPA: 3.87/4), December 2017*

Tongji University - *B.S. in Physics (GPA: 4.45/5), June 2015*

PROFESSIONAL EXPERIENCE

UT Southwestern Medical Center | **Data Scientist,** Dallas TX USA — Sep 2021-present

Quantitative Biomedical Research Center

- Established Python-based CyTOF image analysis pipeline; increased efficiency of analysis by 10x with parallel processing; developed a user-friendly GUI with Flask, HTML/CSS, and Ajax
- Implemented Mask R-CNN in PyTorch for simultaneous nuclei segmentation and classification from H&E-stained histology images, and achieved an 82.5% detection ratio and an 82.0% classification (6-class) accuracy
- Created custom loss function for Mask R-CNN to improve training with deficiently labeled data
- Designed the preprocessing protocol for raw doctors' notes, to train the NLP model for CLASI score prediction

Donald Danforth Plant Science Center | **Data Science Researcher,** St. Louis MO USA — Feb 2020-Sep 2021

Data Science Facility

- Improved and developed new tools for image analysis, object segmentation, classification, and feature detection for PlantCV (Plant phenotyping using Computer Vision, open source); unit testing; version controlled and collaborated by GitHub
- Established a comprehensive processing protocol for automated analysis of RGB, thermal, and hyperspectral imagery, including preprocessing, analysis, post-processing, statistical analysis, and visualization
- Generated instance-wise leaf segmentation and developed algorithms to track leaf growth over time, contributing to understanding the life cycle of plants
- Collaborated with the research team to present data; communicated statistical outcomes using visualization tools

University of Florida Academic Health Center | **Data Science Intern**, Gainesville FL USA — May 2019-Aug 2019

Precision and Intelligent Systems in Medicine Partnership Lab

- Conducted cohort definition and data preprocessing for hospital time-series data analysis
- Extracted time-series feature as patients' major vital signs taken within their first 24-hour hospital admission
- Utilized advanced algorithms to handle irregularities in the time-series data; performed automated statistical analysis, and generated comparison tables to compare time-series clustering results

ACADEMIC RESEARCH EXPERIENCE

Machine Learning and Sensing Lab | **Graduate Research Assistant**, Gainesville FL USA — Mar 2017-Dec 2019

- Developed machine learning algorithms for automated root detection from mini-rhizotron images to save labor and time
- Established processing protocol for automated processing and analyzing of hyperspectral and thermal imagery of plants
- Developed algorithms for automated plant detection from hyperspectral images by hyperspectral endmember detection and un-mixing
- Proposed and developed a classification-friendly dimensionality reduction algorithm to classify genotypes of the identical plant species

TECHNICAL SKILLS

Programming Languages and Tools: Python, MATLAB, Git & GitHub, Flask, MySQL, HTML, CSS, Ajax, Javascript, R, Jupyter Notebook, LaTeX, MS Office, Tableau

Deep Learning Frameworks: PyTorch, spaCy, TensorFlow, Keras

PUBLICATION

- Sheng, H., Wang S., et al. "MTIA: An open-source python package for systematic multiplexed tissue image analysis" (in preparation)
- Rong, R., Sheng, H., Jin, K.W., Wu, F., Luo, D., Wen, Z., Tang, C., Yang, D.M., Jia, L., Amgad, M. and Cooper, L.A., 2022. A Deep Learning Approach for Histology-Based Nuclei Segmentation and Tumor Microenvironment Characterization. bioRxiv, pp.2022-12.
- Yu, G., Zare, A., Sheng, H., Matamala, R., Reyes-Cabrera, J., Fritschi, F.B. and Juenger, T.E., 2020. Root identification in minirhizotron imagery with multiple instance learning. Machine Vision and Applications, 31, pp.1-13.

MISCELLANEOUS

Co-Chair of Committee for Scientific Training and Mentoring at Donald Danforth Plant Science Center