Hudanyun Sheng

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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 and packaged CyTOF image analysis pipeline; speed up to make the processing 10 times faster; created a user-friendly API using Flask
- Implemented Mask R-CNN in PyTorch for simultaneous nuclei segmentation and classification from H&E-stained histology images, with an 82.5% detection ratio and an 82.0% classification (6-class) accuracy obtained
- Modified Mask R-CNN loss functions to train task-specific models with deficiently labeled data

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

Data Science Facility

- Contributed to PlantCV (a python-based open-source image analysis software package targeted for plant phenotyping) by improving and developing new tools for image analysis, object segmentation, classification, and feature detection in images; unit testing; version controlled and collaborated by GitHub
- Established processing protocol that includes preprocessing, analyzing, post-processing, statistical analysis, and visualization for automated analysis of RGB, thermal and hyperspectral imagery
- Generated instance-wise leaf segmentation with pre-trained Mask R-CNN model; developed algorithms to track the growth of leaves over time to understand 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

- Defined the analysis cohort and preprocessed raw data
- Extracted time-series feature as patients' major vital signs taken within their first 24-hour hospital admission
- Applied different algorithms to deal with the irregularity of raw time-series data; compared the time-series clustering results by generating comparison tables and statistical analysis automatically

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 implemented 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, HTML, CSS, Javascript, R, MySQL, Tableau, Jupyter Notebook, LaTeX, MS Office

Deep Learning Frameworks: PyTorch, TensorFlow, Keras

PUBLICATION

R. Rong, H. Sheng et al. "A Deep Learning Approach for Histology-Based Nuclei Segmentation and Tumor Microenvironment Characterization" (2022) (in preparation)

G. Yu, A. Zare, H. Sheng, R. Matamala, J. Reyes-Cabrera, F. Fritschi and T. Juenger, "Root Identification in Minirhizotron Imagery with Multiple Instance Learning," *Machine Vision and* Applications.31, no. 6 (2020): 1-13.

MISCELLANEOUS

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