

# 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

- Implemented MaskRCNN in PyTorch for simultaneous nuclei segmentation and classification from H&E-stained histology images; whole slide histology image analysis
- Modified the MaskRCNN loss functions to train task-specific models
- Established and packaged CyTOF image analysis pipeline

**Donald Danforth Plant Science Center | Data Science Researcher**, St. Louis MO USA

Feb 2020-Sep 2021

Data Science Facility

- Established processing protocol for automated analysis of RGB, thermal and hyperspectral imagery, including preprocessing, processing, post-processing, statistical analysis, and visualization
- Generated instance-wise leaf segmentation using mask-RCNN model; developed algorithms to track growth of leaves overtime to understand the life cycle of the plant during the time period
- 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, feature detection in images; unit testing; version controlled and collaborated by Github
- 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, including data cleaning, outlier detection, batch merging, and data visualization
- Extracted time-series feature by patients' major vital signs taken within their first 24-hour hospital admission
- Applied different methods including interpolation networks 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 (multiple-instance learning) algorithms for automated root detection from mini-rhizotron images to save labor and time
- Established processing protocol for automated preprocessing of hyperspectral and thermal imagery of plants
- Developed algorithms for automated plant detection from hyperspectral images by hyperspectral endmember detection and hyperspectral un-mixing
- Classified genotypes of the same plant species by applying Siamese network on spectra of plant pixels

## TECHNICAL SKILLS

**Programming Languages and Tools:** Python (NumPy, Pandas, Scikit-learn, Scipy, ggplot2, Seaborn, matplotlib, PyTorch, Tensorflow, keras, OpenCV), MATLAB, Git & Github, R, SQL, Tableau, Jupyter Notebook, LaTeX, MS Office.

**Machine Learning:** Regression, Decision Tree, Random Forest, KNN, Naïve Bayes, SVM, PCA, SVD, Clustering, Time-series modeling, Nearest Neighbor, Neural Networks, K means clustering, NLP, Validation techniques

**Statistical Modeling:** Hypothesis Testing, ANOVA, Data Cleaning, Data Mining, A/B Testing

## PUBLICATION

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.

## CERTIFICATES

Google Data Analytics Certificate

## MISCELLANEOUS

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