Qiuchen Zhai

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CAREER OBJECTIVE

Self-motivated Ph.D. candidate with 3 years of research experience in computational image processing and machine learning applications. Actively looking for 2023 summer internships related to image processing and machine learning.

EDUCATION

Purdue University   West Lafayette, IN
Ph.D. candidate in Electrical and Computer Engineering, GPA: 3.74   *August 2019 – Present*

Ohio State University   Columbus, OH
M.S. in Electrical and Computer Engineering, GPA: 3.82   *August 2017 – May 2019*

AREA OF INTERESTS

Computational image processing, computer vision, machine learning techinques.

TECHNICAL SKILLS

Languages: Python, MATLAB, C, C++, SQL
Libraries: Numpy, SciPy, pandas, OpenCV, Scikit-Learn, TensorFlow, Keras, PyTorch

PROFESSIONAL EXPERIENCE

Ptychography and Computational Imaging Methods   West Lafayette, IN
Graduate Research Assistant   *Aug 2019 – Present*
- Developed Projected Multi-Agent Consensus Equilibrium (PMACE) framework for optimization and relevant imaging problems including ptychography.
- Conducted research on memory-efficient implementation of proposed PMACE framework.
- Evaluated proposed framework on ptychographic data which achieved nanometer reconstruction precision.
- Introduced complex extension of classic BM3D and improve the reconstruction accuracy by 47.5% on sparse data.
- Utilized the state-of-the-art denoisers using deep learning techniques, DnCNN, as a prior in the framework to reduce time consumption of regularization agents.

Machine Learning Research for UVA Multispectral Imaging   Columbus, OH
Graduate Lab Assistant   *January 2018 – May 2018*
- Processed digital image signals collected by UAV platform-based multi-sensor system.
- Researched on representative features and extracted local binary pattern (LBP) features, gray-level co-occurrence matrix (GLCM) features and pixel features from pre-processed signals.
- Implemented linear regression (LR), stochastic gradient descent(SGD), k-nearest neighbors algorithm (k-NN), support vector machine (SVM) and CNN-based models for early disease detection.
- Developed disease recognition model based on Random Forest (RF) to automatically discern the sick and infected leaves of cucurbit, achieving a 92.5% classification accuracy.

Objects detection Using YOLO   Columbus, OH
Graduate Lab Assistant   *Aug 2017 – Dec 2017*
- Researched on traditional approaches for object detection including deformable part model (DPM), Region-based convolutional neural network (R-CNN) models.
- Implemented YOLOv1 and YOLOv2 on detection datasets and evaluated the detection precision.

WORK EXPERIENCE

Graduate Research Intern at Los Alamos National Lab (LANL)   Los Alamos, NM
Instructor: Dr. Brendt Wohlberg and Dr. Kevin Mertes   *May 2022 – Aug, 2022*
- Processed raw ptychographic dataset and removed abnormal patterns from dataset.
- Designed position refinement module to correct positioning error for image reconstruction.
- Tested the PMACE on the processed ptychographic dataset and comapared with the state-of-the-arts.
- Developed the python module for data simulation and extended reconstruction module for blind ptychography.

PUBLICATION

Zhai, Qiuchen, Brendt Wohlberg, Gregery T. Buzzard, and Charles A. Bouman. "Projected multi-agent consensus equilibrium for ptychographic image reconstruction." *2021 55th Asilomar Conference on Signals, Systems, and Computers.* IEEE, 2021. [arxiv][code]