QIAN GE

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EDUCATION

North Carolina State University *May 2018 (expected)*
Ph.D. in Electrical Engineering
Overall GPA: 4.0
Advisor: Dr. Edgar Lobaton

University of Electronic Science and Technology of China *Jun. 2011*
M.S. in Electrical Engineering
Overall GPA: 3.69
Advisor: Dr. Hongyang Yu

University of Electronic Science and Technology of China *Jul. 2008*
B.S. in Electrical Engineering
Overall GPA: 3.76

RESEARCH INTERESTS

Image Processing and Computer Vision, Feature Matching, Image Segmentation, Classification
Machine Learning, Deep Learning, Topological Data Analysis (TDA)

TECHNICAL STRENGTHS

Computer Languages Python, MATLAB, C/C++
Framework/Tools TensorFlow, OpenCV, MySQL

RESEARCH EXPERIENCE

A Visual System for Autonomous Foraminifera (forams) Identification

· Developed a coarse-to-fine edge detection strategy to detect blurred and low quality edges between forams chambers with similar texture by using random forest and deep neural networks.
· This approach is able to achieve a high accuracy (88%) with a small training set.
· Leaded the creation of a forams image dataset which contains 1437 forams samples.
· Currently working on robust forams segmentation by combining deep neural networks and topological data analysis.

Consensus-Based Image Segmentation

· Developed a consensus-based image segmentation method through topological persistence, which is robust to parameter selection.
· Modeled a probabilistic image segmentation to represent the probability of a segmentation curve being present in a segmentation set.

Robust Obstacle Detection in Outdoor Traffic Scenes

· Improved the robustness of obstacle segmentation in outdoor scenes by using topological persistence analysis on an obstacle probability map.
· Computed the semantic segmentation of outdoor scenes based on the robust obstacle segmentation and visual features using Markov random field (MRF).

Image Registration based on Robust Topological Features

· Designed an image registration algorithm under bounded non-rigid deformation which guarantees the correct matchings within a certain region.

· Computed an uncertainty map of the registration to indicate the accuracy of the registration for each pixel.

Exploring Victorian Illustrated Newspapers Data through Computer Vision Techniques

· Designed a visual feature for classification of line engravings and halftone images in nineteenth-century British newspapers.

· Clustered and extracted specific scenes such as portraits, crowds, buildings and weather charts using k-means, KNN and SVM based on GIST descriptor.

SELECTED PROJECTS

· Visualization of convolutional neural networks attentions using Class Activation Mapping.
Code can be accessed here: https://github.com/conan7882/CNN-Visualization

· Nature image generation using Generative Adversarial Networks.
Code can be accessed here: https://github.com/conan7882/tensorflow-DCGAN

· Leaf classification based on visual features using PCA and k-means.

· Face recognition based on eigenface using multilayer perceptron (MLP).

· Human activity recognition using hidden Markov model (HMM).

SELECTED PUBLICATIONS

1. **Q. Ge**, E. Lobaton,"Obstacle Detection in Outdoor Scenes based on Multi-Valued Stereo Disparity Maps ",*IEEE Symp. Series Comput. Intell.*, Dec., 2017.
2. **Q. Ge**, B. Zhong, B. Kanakiya, R. Mitra, T. Marchitto, E. Lobaton,"Coarse-to-Fine Foraminifera Image Segmentation through 3D and Deep Features ",*IEEE Symp. Series Comput. Intell.*, Dec., 2017.
3. B. Zhong, **Q. Ge**, B. Kanakiya, R. Mitra, T. Marchitto, E. Lobaton,"A Comparative Study of Image Classification Algorithms for Foraminifera Identification ",*IEEE Symp. Series Comput. Intell.*, Dec., 2017.
4. **Q. Ge**, E. Lobaton,"Consensus-Based Image Segmentation via Topological Persistence ",*IEEE Conf. on Comput. Vis. Pattern Recognit. Workshops (CVPRW)*, July, 2016.
5. S. Chattopadhyay, **Q. Ge**, CP. Wei, E. Lobaton,"Robust Multi-Target Tracking in Outdoor Traffic Scenarios via Persistence Topology based Robust Motion Segmentation ",*IEEE Global Conf. Signal Inf. Process.*, Dec., 2015.
6. CP. Wei, **Q. Ge**, S. Chattopadhyay, E. Lobaton,"Robust Obstacle Segmentation based on Topological Persistence in Outdoor Traffic Scenes ",*IEEE Symp. Series Comput. Intell.*, Dec., 2014.
7. N. Lokare, **Q. Ge**, W. Snyder, Z. Jewell, S. Allibhai, E. Lobaton,"Manifold Learning Approach to Curve Identification with Applications to Footprint Segmentation ",*IEEE Symp. Series Comput. Intell.*, Dec., 2014.
8. **Q. Ge**, N. Lokare, E. Lobaton,"Non-Rigid Image Registration under Non-Deterministic Deformation Bounds ",*10th International Symposium on Medical Information Processing and Analysis*, Oct., 2014.