Yuhang Lu

(858)231-0701 | rudylyh@gmail.com | https://rudylyh.github.io

EDUCATION

University of South Carolina 2017-2022
Ph.D. in Computer Science

Wuhan University 2013-2015
M.E. in Surveying and Mapping

Chengdu University of Technology 2009-2013
B.E. in Spatial Information and Digital Technology

EXPERIENCE

Senior Software Engineer, XPeng Motors Mar 2022-Present
Working on a self-driving project of online BEV map learning from camera images. Developed essential features such as label QA, ground truth generation, stop line detection, and lane classification. Investigated segmentation/tile/anchor-based BEV lane perception methods.

Research Intern, Megvii Technology Sep 2021-Feb 2022
Conducted research on unsupervised homography estimation and proposed a learning method to estimate the homography of two narrow-baseline images with multi-scale transformer and coplanarity-aware GAN, which outperformed previous SOTA by 22% and was published on CVPR 2022.

Research Intern, PAII Lab May 2019-Dec 2019
Studied the problem of anatomical structure segmentation in X-ray images. Proposed a contour-based segmentation method that learns from only one label and performs competitively with fully supervised baselines. Incorporated shape prior knowledge into GCNs to guide contour evolution.

Computer Vision Engineer, EnjoyStudy Technology Jul 2015-Jul 2016
Jointly developed a software for online answer sheet grading. Implemented core modules of image alignment, QR code recognition, layout parsing, and handwritten character recognition. Improved QR recognition success rate from 90% to 99.8% in blurry images.

PROJECTS

Snowvision, University of South Carolina 2017-2021
· Designed an end-to-end framework for automatic heritage fragment identification. Implemented modules of point cloud processing, depth map generation, curve structure segmentation, and fragmented pattern matching. [link]
· Proposed a weakly supervised segmentation method to extract weak curve structures from depth images, and a partial-to-partial texture matching method to match sparse textures on fragmented curve pattern images with handcrafted design templates.

Few-Shot Object Segmentation, University of South Carolina 2020-2021
Investigated the problem of learning general object segmentation from a few la-

bels. Proposed a transductive fine-tuning method to address the domain shift for existing meta-learning methods in cross-domain few-shot segmentation by utilizing unlabeled images.

Urban Satellite Image Segmentation, Wuhan University 2015-2016
Proposed a rule-based method to evaluate the segmentation quality of multi-scale satellite image segmentation results, which can be use for hyperparameter tuning of segmentation algorithms.

Lunar Crater Detection, Chengdu University of Technology 2012-2013
Developed an lunar crater detection method based on handcrafted feature matching, which could automatically localize 75% lunar craters on satellite images.

PUBLICATION

Semi-supervised Deep Large-baseline Homography Estimation with Progressive Equivalence Constraint
H. Jiang, H. Li, Y. Lu, S. Han, S. Liu **AAAI 2023**

Unsupervised Global and Local Homography Estimation with Motion Basis
S. Liu, Y. Lu, N. Ye, C. Wang, B. Zeng **TPAMI 2023**

Snowvision: Segmenting, Identifying, and Discovering Stamped Curve Patterns from Fragments of Pottery
Y. Lu, J. Zhou, S. McDorman, C. Zhang, D. Scott, K. Smith, S. Wang **IJCV 2022**

Unsupervised Homography Estimation with Coplanarity-Aware GAN
M. Hong*, Y. Lu*, N. Ye, C. Lin, Q. Zhao, S. Liu (* co-first author) **CVPR 2022**

Annotation-Efficient Semantic Segmentation with Shape Prior Knowledge
Y. Lu **ACMMM 2021**

Contour Transformer Network for One-shot Anatomy Structure Segmentation
Y. Lu, K. Zheng, W. Li, Y. Wang, S. Wang, L. Lu, C.-F. Kuo, S. Miao **TMI 2020**

Learning to Segment Anatomical Structures Accurately from One Exemplar
Y. Lu, W. Li, K. Zheng, Y. Wang, S. Wang, L. Lu, C.-F. Kuo, S. Miao **MICCAI 2020**

Structured Landmark Detection via Topology-Adapting Deep Graph Learning
W. Li, Y. Lu, K. Zheng, H. Liao, J. Luo, L. Lu, C.-F. Kuo, S. Miao **ECCV 2020**

A Framework for Design Identification on Heritage Objects
J. Zhou*, Y. Lu*, K. Smith, C. Wilder, S. Wang (* co-first author) **PEARC 2019**

Curve-Structure Segmentation from Depth Maps: A CNN-based Approach and Its Application to Exploring Cultural Heritage Objects
Y. Lu, J. Zhou, J. Wang, J. Chen, K. Smith, C. Wilder, S. Wang **AAAI 2018**

Scale-constraint Unsupervised Evaluation for Multi-scale Image Segmentation
Y. Lu, Y. Wan, G. Li **ICIP 2016**

SKILLS

Coding Python, C++, Matlab, C#
ML PyTorch, Tensorflow, Caffe
Tools OpenCV, PCL, CUDA, LaTeX