

Xi Mo (Felix)

Ph.D. Candidate in Electrical Engineering (Computer Vision & Deep Learning), School of Engineering, University of Kansas.

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• Skills

- Python/PyCharm: Proficient
- C++/Visual Studio: Proficient
- Ubuntu/Windows: Proficient
- Visual Basic: Capable
- Matlab: Proficient
- 8051/ARMv9 MCU: Proficient
- OpenCV: Proficient
- Tensorflow/Pytorch: Proficient
- HALCON: Capable
- Stereo Vision: Proficient
- VS Code: Proficient
- SLAM: Capable
- docker/container: Capable

• Education

- **1/22/2017 ~ now**
Ph.D. Degree in progress, majored in EE, University of Kansas
- **3/1/2014 ~ 6/19/2016**
Ph.D. certificate of attendance, majored in Instrument Science and Technology, Harbin Institute of Technology
- **9/1/2011 ~ 3/1/2014**
M.S., majored in Physics, Beihang Univ.
- **9/1/2007 ~ 7/1/2011**
B.S., majored in Automation, Beihang Univ.

• **Current GPA: 3.38**

• Experience

- **8/2020 ~ 5/2021** Teaching/Research Assistant at KU
- **5/2020 ~ 8/2020** Graduate Intern at ABB Robotics R&D
- **8/2018 ~ 5/2020** Teaching Assistant at KU
C++ programming and circuits lab instructor and grader.
- **1/2017 ~ 5/2018** Research Assistant at KU
Research in computer vision and machine learning techniques: 2-D/3D object detection, stereo matching, template matching, and deep neural networks.
- **9/2012 ~ 3/2013** Teaching Assistant at Beihang Univ.
Lab instructor and exams grader in circuit design and operating amperemeter and voltmeter.

• Publications & Projects

- Xi Mo, et al., Project “Realtime Self-Supervised Points Cloud Up-Sampling Network”, manuscript in progress.
- Xi Mo, et al., “Dilated Continuous Random Field for Image Segmentation”. Manuscript submitted to ICRA 2022.
- Xi Mo, et al., “Realtime Global Attention Network for Image Segmentation”. Manuscript submitted to RA-L.
- Xi Mo, et al., “Stereo Frustums: A Siamese Pipeline for 3D Object Detection”. Journal of Intelligent & Robotic Sys., 2020.
- Xi Mo, et al., “An Efficient Approach for Polyps Detection in Endoscopic Videos Based on Faster R-CNN”. International Conference on Pattern Recognition, 2018.
- Xi Mo, et al., “Stereo Matching Using Pixel Classification and Dual-Weighted Guided Filter”. IEEE International Conference on Electronic Measurement & Instruments, 2015.
- Quanlin Dong, Chengjiao Yu, Xi Mo, “Research on Communication Control Technology of TEM Field Emission Gun”. Modern Electronics Technique, Vol. 35, No. 23, Dec 2012.
- Xi Mo and Jieyun Wu, “Study and Implementation of Hardware and Software Interface Based on RFID and WSN Fusion Technology”. Microcomputer Applications, Vol.28, No.7, 2012.

• Awards and Academics

- Serve as the reviewer for ICPR2020, SIBGRAPI 2020, ICRA2022, Journal of Computers and Electrical Engineering
- Virtual Instrument Scholarship, sponsored by National Instrument, Harbin Institute of Technology, 2016.
- “Condenser Based Gas Pressure Sensor”, 20th Competition for Feng-Ru Cup, Tier-3 prize, Beihang Univ, 2010.
- “Multi-Functional Pedometer with Motion Detecting and Exercise Quantification”, 20th Competition for Feng-Ru Cup, Tier -3 prize, Beihang Univ., 2010.

• Selected Works

▪ Research on computer vision and deep learning techniques (2015-now)

Project in progress (2021-2022)

- a) Working on a real-time point cloud up-sampling network using self-supervised up-sampler.
- b) Designing a framework from scratch to realize gradients backpropagation via C++ extensions.
- c) Fast, end-to-end implementation for raw LiDAR points w/o uniform sampling.
- d) Project in designing a pattern recognition algorithm for detecting and classification peaks.

2D object segmentation (2020-2021)

Research on attention mechanism and knowledge distilling, and continuous random field (CRF) in image segmentation, mainly focused on robotic implementations - propose end-to-end, multi-scale deep networks for predicting robotic hand's suction and grasping positions.

3D object detection (2019-2020)

Explored potentials of traditional stereo matching theory and methodology in DL based 3D object detection. Proposed and worked on a light-weighted matching module to segment dense point cloud for following multi-modal regression networks. The novel approach proved to be efficient in processing point cloud, outperforms stereo-only approaches.

2D object detection (2018)

Researched on popular 2D detectors such as SSD, YOLO, Faster R-CNN family, useful feature extraction networks such as Feature Pyramid Network, multi-stage fusion, network regularization methods such as focal loss function, dropout layers, and batch normalization. Published a paper on the topic of implementing Faster RCNN in polyp detection task using convincing metrics.

Stereo vision (2015)

Proposed and worked on a dual-weighted local stereo matching algorithm that take the advantage of pixel similarity and regional similarity. Results on Middlebury dataset showed qualitative improvements.

▪ Research on machine learning techniques and controlling theories (2013)

This project was based on my master's thesis. I proposed to implement fuzzy control theories as well as machine learning techniques including clustering to work on the challenging task of automatically calibrating anastigmat coils of a 200kV TEM. Normal operational data of anastigmat coils and correction controlling values were collected during a period (3 months). Then I established a T-S fuzzy controller whose member subsets and functions are generated via FCM (Fuzzy C-Means) clustering algorithm. The proposed controller proved its effectiveness via MATLAB simulation and real tests.

▪ Communication hardware and software designs (2010-2012)

Worked on several projects designing hardware and software for TEM (Transmission Electron Microscope) and RFID (Radio Frequency Identification) device, including designing I2C bus and SPI interfaces based on 8051 and C8051 series micro-controllers, and the coding for transmitting data between chips such as MMA7260Q 3-axis acceleration sensor, Zigbee wireless controller, MFRC500 RF(Radio Frequency) reader. I was also the designer of the project, namely 'Multi-Functional Pedometer with Motion Detecting and Exercise Quantification' (2010), during my undergraduate period. It was a multi-functional pedometer implemented with Kalman filter, which has a liquid crystal display to show steps. The pedometer can transmit data to PC via SPI interface, then a program coded in Visual Basic can analyze the data and calculate Calories.