

## Employment

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| <b>Research Engineer, UAE</b> | <b>New York University Abudhabi</b> | <b>September 2018 – August 2019</b> |
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- Worked with research teams to develop **machine-learning algorithms** for 2D/3D visual learning applications including multi-organ segmentation from CT/MRI images and deep feature learning from point clouds;
  - Realized **high-quality network training and validation** via data augmentation, cross validation, learning rate scheduling, gradient scaling and etc. to enhance the proposed networks' capability by 5-15% generally;
  - Conducted **Ensemble Learning** over learned models to boost eventual testing performance.
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| <b>Research Assistant, USA</b> | <b>New York University</b> | <b>Fall 2019 - December 2020</b> |
|--------------------------------|----------------------------|----------------------------------|
- Worked on advanced learning-based algorithms of environment perception for **autonomous driving**;
  - Developed a **lane segmentation** algorithm, applying CRF/MRF-based CNNs instead of RNNs to learn both textural and structural knowledge. The algorithm reduced cost by 5-7% and obtained an accuracy of 72.1% on the CULane database;
  - Proposed a supervised **object detection** network to jointly detect objects and estimate ego-object distance;
  - Exploited a self-supervised ego-motion and depth estimation algorithm in visual **SLAM** applications, which fused bundle adjustment into CNNs so as to predict motion matrices and obtain a depth estimation accuracy of 94.9% on KITTI database;
  - Some algorithms were accepted by Xmotors.ai (Xpeng Motors Inc.) and applied into its self-driving-car prototypes.

## Projects

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|------------------------------------|-------------------------|-----------------------------------|
| <b>Leaf Disease Classification</b> | <b>Technical Leader</b> | <b>December 2020 - March 2021</b> |
|------------------------------------|-------------------------|-----------------------------------|
- Participated in Kaggle Cassava Leaf Disease Classification Competition and earned a **silver medal** as 19/3900 teams;
  - Proposed classification networks in a semi-supervised manner through **pseudo labelling** to effectively use unlabeled data;
  - Combined well-trained learning units including VGG, U-Net, EfficientNets via a LightGBM framework (**Ensemble Learning**), and boosted the classification accuracy at 90.11% on the Kaggle private database.
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| <b>Object Detection in Traffic Scenarios</b> | <b>Main Contributor</b> | <b>Fall 2019 - October 2020</b> |
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- Worked on advanced algorithms of **object detection** and **depth estimation** in autonomous driving scenarios;
  - **Constructed datasets** of objects' coordinates with their depth map. By aligning object's coordinates with scenes' depth map, which were independent in KITTI and Nuscenes databases, the new datasets provided labels of ego-object distance;
  - Proposed a supervised network to jointly detect objects and predict a dense depth map of detected objects, achieving an average depth estimation accuracy of 93.7% on KITTI public databases and outperforming the SOTA methods;
  - **Publication:** *Pairwise Attention Encoding for Point Cloud Feature Learning* on International Conference on 3DV 2019.
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| <b>Multi-organ segmentation</b> | <b>Technical Leader</b> | <b>October 2018 - April 2019</b> |
|---------------------------------|-------------------------|----------------------------------|
- Worked on 2D/3D multi-organ segmentation from head-and-neck and abdominal **CT/MRI** images;
  - Developed a coarse-to-fine organ detection DNN, which estimated coarse locations of a organ in axial-view (2D) images and provided a detailed segmentation in the 3D voxels, to reduce heavy computational costs of **3D voxel processing**;
  - The proposed method achieved an average segmentation accuracy of 86.6% on the NIH Public Pancreas Database and 68.6% on a private head-and-neck small organ segmentation database created by Emory University School of Medicine.

## Education

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| <b>New York, USA</b> | <b>New York University</b> | <b>Fall 2019 – May 2021</b> |
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- M.S.E. in Electrical Engineering, May 2021.  
Graduate Coursework: Machine Learning; Artificial Intelligence; Computer Vision; Computer Architecture.
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| <b>Tianjin, PRC</b> | <b>Tianjin University</b> | <b>Fall 2011 – January 2018</b> |
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- M.S.E. in Electronics and Communication Engineering, January 2018.  
Graduate Coursework: Algorithms; Image Processing; Wireless Communication; Computational Theory.
  - B.S.E. in Electronic Science and Technology, May 2015.  
Undergraduate Coursework: Computer Architecture; Algorithms; Programming Languages.

## Technical Skills

- Programming Languages: Python; C++/CUDA; SQL; PHP; Java; JavaScript
- Frameworks: Pytorch; Tensorflow; Keras; Pandas; Spark; Django
- Other skills: Linux Bash; Google Cloud; Amazon Web Services; Git; Photoshop