Mingren Shen

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Education

University of Wisconsin-Madison   *Overall GPA: 3.9 / 4.0*

  M.S. Computer Sciences, May 2019

  M.S. Materials Science and Engineering December 2020

  Ph.D. Materials Science and Engineering, December 2021

University of Chinese Academy of Sciences M.S. Physics , July 2016   *Overall GPA: 3.9 / 4.0*

Nanjing University B.S. Physics, July 2013   *Overall GPA: 3.8 / 4.0*

Work Experience

Machine Learning Engineer   *Internship at Ansys Inc.; June. 2021 - August.2021*

- Built Convolution Neural Network (CNN) to correct the lower resolution 3-D flow fields to higher resolution ones with less time and few resources and achieved 40% acceleration in speed and 20% less memory usage

SELECTED PROJECTS

Use of Machine Learning For Identification of Mucinous Pancreas Cancer   *June. 2020 - June. 2021*

- Examine the prediction potential of building pancreas cancer classifiers based on radiometric features
- Solved imbalanced data problem with Synthetic Minority Oversampling Technique(SMOTE) achieved 85% accuracy

Automated Defect Recognition in Electron Microscopy Images and Videos   *March. 2018 - March. 2020*

- Automated identification of defects in electron microscopy images or videos of irradiated steels where Faster RCNN (ChainerCV) was used microscopy images and YOLO(Tensorflow) was used for microscopy videos
- Improved performance F1 from 0.65/0.78 to 0.91/0.95 which was faster and more stable than human experts

GAN for Super Resolution of Simulated STEM Images   *September. 2018 - October. 2020*

- Developed Generative Adversarial Networks (pix2pix) model to convert lower resolution but fast generate simulated STEM images to the higher resolution but slower generated images.
- Reduced relative error from 10% to 1% and satisfied all physical requirements

Identifying Bleeding Sites on Blood Vessel X-ray Images   *September. 2018 - May. 2021*

- Developed a two-stage model to solve the bleeding site detection problem.
- The first stage (ResNet152) classifies bleeding and non-bleeding patients, achieving 86% accuracy
- The second stage (YOLO) finds the bleeding sites on the image, identifying 13 of the 19 bleeding sites

Others   *Course Projects*

- **Building Query Time Optimized Video Inference System by Feature Map Reusing**: Reducing latency of a video inference system by reusing intermediate results of the first CNN (ResNet50) to accelerate the second CNN (ResNet152) and achieved 18% latency reduction without sacrificing the accuracy of the model
- **BBQ: Bounding Box Quality Checker** Web service built with Flask for checking errors of object detection
- **Twitter Gender Classifier**: Collected Twitter user data(text and profile) from St Louis, MO to build a user gender classifier(Random Forest) based on Twitter messages.
- **Driver-test-schedule-system**: Developed email reminder service for Driver-testers when there were personalized available space for their driving test in College Town of TAMU.

Skills

- **Programming**: Python, Java, C, HTML/CSS, JavaScript
- **Software**: Linux, Git, Bash, SQL, Matlab, Pandas, Scikit-learn, OpenCV, Spark, Flask, Django, Docker
- **Frameworks**: Keras, PyTorch, Tensorflow
- **Areas**: Deep Learning, Machine Learning, Software Development, Computer Vision

Selected Publications

1. **Mingren Shen** et al. *Multi Defect Detection and Analysis of Electron Microscopy Images with Deep Learning*, Computational Materials Science 199 (2021): 110576.
2. **Mingren Shen** et al. *A deep learning based automatic defect analysis framework for In-situ TEM ion irradiations*, Computational Materials Science 197 (2021): 110560.
3. **Mingren Shen** et al. *Assessing Graph-based Deep Learning Models for Predicting Flash Point*, Molecular Informatics (2020), 39 , 1900101.
4. **Mingren Shen** et al. *Machine learning principles applied to CT radiomics to predict mucinous pancreatic cysts*, Abdominal Radiology (2021): 1-11.