Mingren Shen

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Education

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

Ph.D. Materials Science, focus on machine learning for material informatics, expected December 2021

M.S. Computer Sciences, May 2019; M.S. Materials Science, December 2020

SelectedCourses: *Artificial Intelligence, Algorithm, Big Data Systems, Machine Learning, Data Science Principles*

Teaching Assistant of Chem 103(2 Semesters)

University of Chinese Academy of Sciences M.S. Physics , July 2016 *Overall GPA: 3.8 / 4.0*

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

SELECTED PROJECTS

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

- Examine the prediction potential of building pancreas cancer classifiers based on radiometric features
- Solved the imbalanced dataset problem with Synthetic Minority Oversampling Technique (SMOTE)
- Accepted in annual meeting of Society of Abdominal Radiology, 2021

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

- Automated identification of dislocation loops in irradiated steels
- Used Faster R-CNN (ChainerCV) for detecting material defects in microscopy images and YOLO(Keras+Tensorflow) 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 - Present*

- 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**.
- Accepted by a radiologist conference, CIRSE2019 and CIRSE2020.

Others *Course Projects*

- **Building Query Time Optimized Video Inference System by Feature Map Reusing**: Optimizing the latency of a video inference system by reusing the intermediate results of first CNN (ResNet50) to accelerate the calculation of second CNN (ResNet152) znd achieved **18% latency decrease without sacrificing the accuracy of the model**
- https://github.com/iphyer/FocousIngestOpt_FinalProject_CS744Fall2018
- **BBQ: Bounding Box Quality Checker,**: A web service built with Flask for checking the quality of object detection algorithm. https://github.com/iphyer/BBQ_Madhacks2018
- **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. https://github.com/iphyer/cs760_TwitterDemographics
- **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. https://github.com/iphyer/RoadTest-Scheduler

Skills

Programming: Python, Java, C **Software**: Linux, Git, Bash **Frameworks**: Keras, PyTorch, Pandas, Scikit-learn, OpenCV

Selected Publications

1. Gurbani, Sidharth, Dane Morgan, Varun Jog, Leo Dreyfuss, **Mingren Shen**, Arighno Das, E. Jason Abel, and Meghan G. Lubner. "Evaluation of radiomics and machine learning in identification of aggressive tumor features in renal cell carcinoma (RCC)." Abdominal Radiology (2021): 1-11.
2. Lawrence, Nick, **Mingren Shen**, Ruiqi Yin, Cloris Feng, and Dane Morgan. "Exploring Generative Adversarial Networks for Image-to-Image Translation in STEM Simulation." arXiv preprint arXiv:2010.15315 (2020).
3. Xiaoyu Sun, Nathaniel J. Krakauer, Alexander Politowicz, WeiTing Chen, Qiying Li, Zuoyi Li, Xianjia Shao, Alfred Sunaryo, **Mingren Shen**, James Wang, Dane Morgan."Assessing Graphbased Deep Learning Models for Predicting Flash Point." Molecular Informatics (2020), 39 , 1900101.

4. Liu, Yilin, Gregory R. Kirk, Brendon M. Nacewicz, Martin A. Styner, **Mingren Shen**, Dong Nie, Nagesh Adluru, Benjamin Yeske, Peter A. Ferrazzano, and Andrew L. Alexander. "Harmonization and Targeted Feature Dropout for Generalized Segmentation: Application to Multi-site Traumatic Brain Injury Images." In Domain Adaptation and Representation Transfer and Medical Image Learning with Less Labels and Imperfect Data, pp. 81-89. Springer, Cham, 2019.
5. **Ming-Ren Shen**, Rui Liu, Ke Chen, and Mingcheng Yang. "Diffusive-Flux-Driven Microturbines by Fore-and-Aft Asymmetric Phoresis." Physical Review Applied 12, no. 3 (2019): 034051.
6. Luo, Guan-Zheng, Ziyang Hao, Liangzhi Luo, **Mingren Shen**, Daniela Sparvoli, Yuqing Zheng, Zijie Zhang et al. "N 6-methyldeoxyadenosine directs nucleosome positioning in Tetrahymena DNA." Genome biology 19, no. 1 (2018): 200.
7. **Ming-Ren Shen**, Fangfu Ye, Rui Liu, Ke Chen, Mingcheng Yang, and Marisol Ripoll. "Chemically driven fluid transport in long microchannels." The Journal of chemical physics 145, no. 12 (2016): 124119.