

# MINGREN SHEN

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## EDUCATION

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### University of Wisconsin-Madison

Overall GPA: 3.99 / 4.0

M.S. Computer Sciences, expected December 2019

Selected Courses: *Artificial Intelligence, Algorithm, Big Data Systems, Machine Learning, Data Science: Principles, Algorithms, and Applications*

### University of Chinese Academy of Sciences

Overall GPA: 3.93 / 4.0

M.S. Physics, January 2017

### Nanjing University

Overall GPA: 3.82 / 4.0

B.S. Physics, July 2013

## SELECTED PROJECTS

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### Automated Defect Recognition in Electron Microscopy Images

March. 2018 - Present

Advisor: Prof. Dane Morgan, Department of Materials Science and Engineering, UW-Madison

- Automated Image Analysis for identifying dislocation loops in irradiated steels
- Faster R-CNN module in ChainerCV was used to identify material defects in Electron Microscopy Images
- Helped improve the model performance **F1 from 0.65 to 0.91** which is faster and more stable compared to human level experts

### Depp Learning for simulated STEM Image Super resolution

September. 2018 - Present

Advisor: Prof. Dane Morgan, Department of Materials Science and Engineering, UW-Madison

- Developed Generative adversarial networks ( Pix2Pix GAN ) model to convert lower resolution but fast generate simulated STEM images to the higher resolution but slower generated images. The relative error is **reduced from 10% to 1%**.
- GAN model not only improves the mean square error of generated images but also preserves all physical meanings of the STEM images

### Identifying Active Extravasation on Arteriograms with Deep Learning

September. 2018 - Present

Advisor: Prof. Dane Morgan, Prof. Po-Ling Loh, Prof. Varun Jog, MD. Mark Kleedehn, UW-Madison

- A two-stage method was used to solve the extravasation detection problem, where the first stage was used to classify whether a bleed was present and the second stage where an object detector was trained to identify the site of bleeding.
- ResNet-152 was used as the first stage classifier and Faster R-CNN was used as the second stage object detector.
- The first stage of the algorithm was **86% accuracy**. The second stage of the algorithm **correctly identified 5 of the 10 sites of bleeding**.
- The results are submitted to a radiologist conference(CIRSE2019).

### Building Query Time Optimized Video Inference System by Feature Map Reusing

Course Projects

Advisor: Prof. Shivaram Venkataraman, Department of Computer Science, UW-Madison

- Optimizing the latency of a two CNNs video inference system by reusing the intermediate results of first CNN( ResNet50 ) to accelerate the calculation of second CNN( ResNet152 )
- We successfully achieved **18% latency decrease without sacrificing the accuracy of the model**
- [https://github.com/iphyer/FocusIngestOpt\\_FinalProject\\_CS744Fall12018](https://github.com/iphyer/FocusIngestOpt_FinalProject_CS744Fall12018)

## SKILLS

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Programming Languages : Python, Java, C

Software & Framework: Github, Pandas, scikit-learn, Keras, ChainerCV, LaTeX, Linux, Bash

## PUBLICATIONS

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1. 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.

2. **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.
3. **Ming-Ren, Shen**, Liu Rui, Hou Mei-Ying, Yang Ming-Cheng, and Chen Ke. “Mesoscale simulation of self-diffusiophoretic microrotor.” *ACTA PHYSICA SINICA* 65, no.17 (2016).