Mingren Shen

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Education

University of Wisconsin-Madison *Overall GPA: 3.99 /4.0*
M.S. Computer Science, expected December 2019

University of Chinese Academy of Sciences *Overall GPA: 3.93/4.0*
M.S. in Physics , January 2017

Nanjing University *Overall GPA: 3.82/4.0*
B.S. Physics, School of Physics ,July 2013

RESEARCH PROJECTS

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

GAN for Super Resolution Simulated STEM Images *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).

Submarine : Combine Hadoop system with deep learning training tasks *January. 2019 - Present*
Advisor: Prof. Shivaram Venkataraman, UW-Madison

- Build quality-driven scheduler for common deep learning training tasks with mature Hadoop ecosystem
- By inspecting the quality of hyper parameter performances, this project encourages the good candidates to have more resources to train
- The most exciting part is that all the training can be done in Hadoop System with the help of YARN and Docker

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/FocousIngestOpt_FinalProject_CS744Fall2018

Teaching Assistant of Chem 103 *Sep. 2017 - Mar. 2018*
Department of Chemistry, UW-Madison

- Lead discussion session

Publications

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).

Strengths

Programming Languages : Python, Java, C

Tools : Github, Pandas, scikit-learn, TensorFlow, LaTeX, Linux, Bash

SELECTED COURSES

CS302	Introduction to Programming	A
CS367	Introduction to Data Structures	A
CS506	Software Engineering	A
CS540	Introduction to Artificial Intelligence	A
CS577	Introduction to Algorithm	A
CS744	Big Data Systems	A
CS760	Machine Learning	A
CS770	Human-Computer Interaction	A
CS839	Data Science: Principles, Algorithms, and Applications	A
CS766	Computer Vision	Spring,2019