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EDUCATION

Doctor of Philosophy in Electrical Engineering 　　　　　　　　　　　May 2020

West Virginia University, Morgantown, WV

　　Dissertation: On Body Mass Index Analysis from Human Visual Appearance
　　Advisor: Professor Guodong Guo

Mast of Science in Detection Technology and Automation Devices 　　　June 2010

China University of Mining and Technology, Beijing, China

　　Dissertation: The research on ZigBee based Pressure Sensor for Mining
　　Advisor: Professor Zhenchong Wang

Bachelor of Science in Electrical Engineering and Automation 　　　　June 2007

China University of Mining and Technology, Beijing, China

RESEARCH INTERESTS

Image Processing, Signal Detection, Computer vision, Biometrics, Radio Astronomy, Machine Learning

WORK EXPERIENCE

Algorithm Engineer 　　　　　　　　　　　　　　　　　　　July 2020 – Present

KLA Corporation, Milpitas, CA

• Develop advanced image processing and signal detection algorithms that aim to solve specific wafer image problems, such as noise and distortion, etc.

• Explore and develop new attributes that can capture the specific characteristics of the wafer images.

• Implement algorithms in C/C++ programming language.

• Develop and Implement existing detection algorithms with Tensorflow custom OP and GPU CUDA kernels. Optimize CUDA kernels for throughput purposes.

Electrical Engineer 　　　　　　　　　　　　　　　　　　June 2010 - June 2012

China Coal Technology & Engineering Group Corp, Beijing, China

• Power distribution system and Programmable Logic Controller (PLC) design for industrial buildings.

RESEARCH EXPERIENCES

Research Collaboration

Project: Polyp detection for colonoscopy images in Colorectal cancer screening. 　Dec 2022- June 2023

• Implemented a YOLOv5 object detection model to investigate the performance of mainstream one-stage approaches in colorectal polyp detection.

• A variety of training datasets and model structure configurations are employed to identify the determinative factors in practical applications.

Project: Anomaly detection method for fire warning. 　　　　　　　Dec 2021- May 2022

• Propose an approach that utilizes a fiber-optic distributed temperature sensing (FO-DTS) system and a convolution neural network based anomaly detection models to monitor the fire exotherm during the early stages of accidents.

Research Assistant 　West Virginia University - Morgantown, West Virginia

Project: Body Mass Index (BMI) Estimation from Human Visual Appearance.   August 2016 – May 2020

• Developed a computational framework for estimating body weight from 2D body images which consists of feature detection and computation, and training. It outperforms recent state-of-the-art approaches.

• Systematically analyzed visual BMI estimation problem from the feature level by deploying several deep-face models and geometric models. This is the first work on this topic.

• Proposed a two-stage learning method (includes reinforcement learning and estimator optimization) for BMI estimation from face images which outperforms regression-based approaches.

• Proposed a label ranking based deep neural network (DNN) for BMI estimation from a large-scale BMI face images dataset with significant improvement in facial BMI estimation.

• Proposed a modeling-based BMI estimation approach for 3D reconstruction of body data.

Project: Autism Spectrum Disorder (ASD) Detection.   May 2018 – Jan 2019

• Developed a method to analyze the differences between photos taken by people with ASD and those without ASD from the **visual features and deep features**. This is the first work to analyze autism with the computer vision method.

Project: Face Recognition.   Jan 2017 – May 2018

• Collaborated with a team to propose a body pose detection based approach for unconstraint face detection on a large dataset that achieved one of the best performances in UCCS face detection challenge.

• Proposed a discriminative common feature subspace learning method for large-scale cross-age face recognition which outperforms most existing methods.

Project: 1D/2D Astronomical Signal Denoising and Detection.   August 2013 – July 2016

• Proposed a wavelet-based method for efficiently denoising de-dispersed radio signals of Rotating Radio Transients (RRATs) which contributed to significantly reducing the parameters' errors (16%-90%) of 8 RRATs.

• Proposed a curvelet-based denoising method for isolated astronomical pulse signals which leads to a higher detection rate (98.7%) than existing denoising methods.

HONORS AND AWARDS

• Rank 3rd in the Unconstraint College Student (UCCS) Face detection Challenge at the 2017 IEEE International Joint Conference on Biometrics (IJCB)

• 2008-2010 Outstanding Student Honor of China University of Mining and Technology

• 2004-2007 Outstanding Student Honor of China University of Mining and Technology

PROFESSIONAL ACTIVITIES

Serving as reviewer for IEEE Transactions on Cybernetics, IEEE Transactions on Information Forensics and Security, IEEE Transactions on Biometrics Behavior and Identity Science, IEEE Access, IET Computer Vision, IET Image Processing, IET Biometrics.

PUBLICATIONS

Journal Articles

• Bian, H., **Jiang, M**. and Qian, J., 2023. The investigation of constraints in implementing robust AI colorectal polyp detection for sustainable healthcare system. Plos one, 18(7), p.e0288376.

• Bian, H., Zhu, Z., Zang, X., Luo, X. and **Jiang, M.***(corresponding author), 2022. A CNN based anomaly detection network for utility tunnel fire protection. Fire, 5(6), p.212.

• **Jiang, M.**, Guo, G. and Mu, G., 2020. Visual BMI estimation from face images using a label distribution based method. Computer Vision and Image Understanding, 197, p.102985.

• Yu, Y.F., Wang, Q. and **Jiang, M.***(corresponding author), 2020. Discriminative common feature subspace learning for age-invariant face recognition. IET Biometrics, 9(4), pp.136-142.

• **Jiang, M.**, Shang, Y. and Guo, G., 2020. Computational approach to body mass index estimation from dressed people in 3D space. IET Image Processing, 14(7), pp.1248-1256.

• Guo, A.Z. and **Jiang, M.**, 2020. Artificial intelligence techniques as potential tools for large scale surveillance and interventions for obesity.

• **Jiang, M.** and Guo, G., 2019. Body weight analysis from human body images. IEEE Transactions on Information Forensics and Security, 14(10), pp.2676-2688.

• **Jiang, M.**, Shang, Y. and Guo, G., 2019. On visual BMI analysis from facial images. Image and Vision Computing, 89, pp.183-196.

• **Jiang, M.**, Cui, B., Yu, Y.F. and Cao, Z., 2019. DM-Free curvelet based denoising for astronomical single pulse detection. IEEE Access, 7, pp.107389-107399.

• Yu, Y.F., Xu, G., **Jiang, M.**, Zhu, H., Dai, D.Q. and Yan, H., 2019. Joint transformation learning via the l 2, 1-norm metric for robust graph matching. IEEE transactions on cybernetics, 51(2), pp.521-533.

• Yu, Y.F., Ren, C.X., **Jiang, M.**, Sun, M.Y., Dai, D.Q. and Guo, G., 2019. Sparse approximation to discriminant projection learning and application to image classification. Pattern Recognition, 96, p.106963.

• **Jiang, M.**, Cui, B.Y., Schmid, N.A., McLaughlin, M.A. and Cao, Z.C., 2017. Wavelet denoising of radio observations of rotating radio transients (RRATs): Improved timing parameters for eight RRATs. The Astrophysical Journal, 847(1), p.75.

Conference Paper

• Günther, M., Hu, P., Herrmann, C., Chan, C.H., **Jiang, M.**, Yang, S., Dhamija, A.R., Ramanan, D., Beyerer, J., Kittler, J. and Al Jazaery, M., 2017, October. Unconstrained face detection and open-set face recognition challenge. In 2017 IEEE International Joint Conference on Biometrics (IJCB) (pp. 697-706).

• Zhang, Y., **Jiang, M.**, Wu, Y. and Zhou, X., 2015, June. An automatic rebar splitting system based on two-level of the chain transmission. In 2015 IEEE International Conference on Cyber Technology in Automation, Control, and Intelligent Systems (CYBER) (pp. 587-590).

REFERENCES

Guodong Guo, Adjunct Associate Professor

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Maura McLaughlin, Professor

West Virginia University, Morgantown, WV

maura.mclaughlin@mail.wvu.edu

Matthew Valenti, Professor

West Virginia University, Morgantown, WV

matthew.valenti@mail.wvu.edu

SKILLS

• Programming Language: C/C++, CUDA, Python, Matlab.

• Libraries: Tensorflow, OpenCV

• Tools: Visual Studio, VS CODE, CACD