GUOQING WANG

OFFICE: Room 316, CSIRO Marsfield Site, PO Box 76, Epping, NSW 1710, Australia
EMAIL: wangguoqingcumt@hotmail.com **HOMEPAGE:** https://gq-wang.github.io/

RESEARCH STATEMENT

My ultimate goal is to design advanced learning algorithms that are able to abstract knowledge from images/videos/languages, and use the learned knowledge to solve both high-level (e.g., classification, generation, salient object detection, semantic segmentation, and visual reasoning etc.) and low-level (e.g., image restoration, depth/3D estimation from a single 2D image etc.) downstream computer vision tasks. In particular, the algorithms should be data-efficient and resource-efficient, and should be able to generalize the learned knowledge to solve problems with images/videos from different domains and in the wild (not limited to synthetic and controlled environment).

RESEARCH INTEREST

Machine Learning: self-/semi-/un- supervised learning and few-shot learning, domain adaptation, meta learning, multi-task learning, network interpretation and optimization
Computer Vision: holistic image/video understanding (classification, generation, restoration, salient object detection, semantic segmentation, depth estimation etc.), adversarial attack, network compression, neural architecture search, efficient network routing

EDUCATION

University of New South Wales Sep. 2017 - Aug. 2020 (Expected)
Ph.D. in Computer Science and Engineering *Advisors: Dr. Changming Sun, Prof. Arcot Sowmya*

China University of Mining and Technology Sep. 2014 - Jul. 2017
M.S. in Control Engineering *Advisor: Prof. Jun Wang*

Tianjin University Feb. 2014 - Aug. 2014
Visiting Student and Research Assistant *Advisor: Prof. Gang Li*

China University of Mining and Technology Sep. 2010 - Jun. 2014
B.S. in Information Engineering *Advisor: Prof. Jun Wang*

HONORS AND AWARDS

ICCV Student Travel Grant	2019
UNSW Postgraduate Research Student Support (PRSS) Scholarship	2019
UNSW/CSIRO Postgraduate Scholarships	2017-2021
Best Master Dissertation of Jiangsu Province	2017
CUMT Excellent Graduate Student Award	2017
National Scholarship	2016,2017
First Prize in RoboCup Carrying Robot Competition	2012,2014,2015
Second Prize in National Graduate Mathematical Contest in Modelling	2015
Outstanding Youth Award of CUMT	2015
Excellent Youth League Member of Jiangsu Province	2014

CUMT Excellent Undergraduate Student Award 2014

Outstanding Volunteer Award for NXP Smart Car Competition 2012

SELECTED PUBLICATIONS

PAPERS IN REVIEW

22. **[IJCV'20]** Guoqing Wang, Changming Sun, Arcot Sowmya. "Context-enhanced Representation Learning for Single Image De-Raining." *International Journal of Computer Vision*, 2020.[pdf]
21. **[IJCV'20]** Guoqing Wang, Changming Sun, Arcot Sowmya. "Learning Entangled Representation for Single Image De-Raining." *International Journal of Computer Vision*, 2020.[pdf]
20. **[T-IP'20]** Guoqing Wang, Changming Sun, Arcot Sowmya. "Bi-Component Aware Learning for Single Image De-Raining." *IEEE Transactions on Image Processing*, 2020.[pdf]
19. **[T-IFS'20]** Guoqing Wang, Changming Sun, Arcot Sowmya. "Sparse Coding of Deep Relational and Residual Descriptors for Vein Recognition." *IEEE Transactions on Information Forensics and Security*, 2020.[pdf]
18. **[CVPR'20]** Guoqing Wang, Changming Sun, Arcot Sowmya. "Three Anonymous Submissions." *IEEE Conference on Computer Vision and Pattern Recognition*, 2020.[pdf]

JOURNAL

17. **[T-IFS'19]** Guoqing Wang, Changming Sun, Arcot Sowmya. "Learning a Compact Vein Discrimination Model With GANerated Samples." *IEEE Transactions on Information Forensics and Security*, 2019.[pdf]
16. **[T-IFS'19]** Guoqing Wang, Changming Sun, Arcot Sowmya. "Multi-Weighted Co-Occurrence Descriptor Encoding for Vein Recognition." *IEEE Transactions on Information Forensics and Security*, 2019.[pdf]
15. **[Access'18]** Jun Wang, Zaiyu Pan, Guoqing Wang, Ming Li, Yulian Li . "Spatial Pyramid Pooling of Selective Convolutional Features for Vein Recognition." *IEEE Access*, 2018.[pdf]
14. **[Access'18]** Jun Wang, Kai Yang, Zaiyu Pan, Guoqing Wang, Ming Li, Yulian Li. "Minutiae-Based Weighting Aggregation of Deep Convolutional Features for Vein Recognition." *IEEE Access*, 2018.[pdf]
13. **[IEICE T-IS'18]** Jun Wang, Guoqing Wang*, Zaiyu Pan. "Gender Attribute Mining with Hand-Dorsa Vein Image Based on Unsupervised Sparse Feature Learning." *IEICE Transactions on Information and Systems*, 2018.[pdf]
12. **[T-IFS'17]** Jun Wang, Guoqing Wang*, Mei Zhou. "Bimodal Vein Data Mining via Cross-Selected-Domain Knowledge Transfer." *IEEE Transactions on Information Forensics and Security*, 2017.[pdf]
11. **[T-IFS'17]** Jun Wang, Guoqing Wang*. "Quality-Specific Hand Vein Recognition System." *IEEE Transactions on Information Forensics and Security*, 2017.[pdf]
10. **[CMMM'17]** Guoqing Wang*, Jun Wang. "SIFT Based Vein Recognition Models: Analysis and Improvement." *Computational and Mathematical Methods in Medicine*, 2017.[pdf]
9. **[OPTIK'17]** Jun Wang, Guoqing Wang*. "Hand-Dorsa Vein Recognition with Structure Growing Guided CNN." *International Journal for Light and Electron Optics*, 2017.[pdf]
8. **[IEICE T-IS'17]** Guoqing Wang*, Jun Wang, Zaiyu Pan. "Bimodal Vein Recognition Based on Task-Specific Transfer Learning." *IEICE Transactions on Information and Systems*, 2017.[pdf]
7. **[CIT'17]** Ming Hao, Caifeng Lu, Guoqing Wang*, Wei Wang. "An Improved Neuron Segmentation Model for Crack Detection." *Cybernetics and Information Technologies*, 2017.[pdf]
6. **[OPTIK'16]** Jun Wang, Guoqing Wang*, Ming Li, Wenkai Du. "Hand Vein Recognition Based on PCET." *International Journal for Light and Electron Optics*, 2016.[pdf]

5. **[CIT'16]** Guoqing Wang*, Jun Wang, Ming Li, Yaguang Zheng, Kai Wang. "Hand Vein Image Enhancement Based on Multi-Scale Top-Hat Transform." *Cybernetics and Information Technologies*, 2016.[pdf]
4. **[BIAUTO'15]** Jun Wang, Guoqing Wang*, Ming Li, Wenkai Du, Wenhui Yu. "Hand Vein Images Enhancement Based on Local Gray-level Information Histogram." *International Journal Bioautomation*, 2015.[pdf]
3. **[BIAUTO'14]** Jun Wang, Guoqing Wang*, Ming Li, Kairui Wang, Hao Tian. "Hand Vein Recognition Based on Improved Template Matching." *International Journal Bioautomation*, 2014.[pdf]

CONFERENCE

2. **[ICCV'19]** Guoqing Wang, Changming Sun, Arcot Sowmya. "ERL-Net: Entangled Representation Learning for Single Image De-Raining." *International Conference on Computer Vision*, 2019.[pdf]

BOOK

1. Jun Wang, Guoqing Wang, Ming Li. "Vein Pattern Encoding and Identification." *China Science Publishing*, 2018.[link]

GRANTS

3. **[co-PI]** with Jun Wang, National Research and Product Project, "Research and Implementation of Interactive Two-Wheeled Self-Balancing Robot", 2015.05-2018.05.
2. **[PI]**, Jiangsu Province Innovative Project for Undergraduate, "Hyperspectral Image-Based Approach for Composition Analysis of Mixed Solution", 2015.06-2016.06.
1. **[PI]**, National College Students Innovation Project, "Online PMS(Pressure Monitoring System) for Hydraulic Supports of Mining Surface", 2012.05-2013.05.

PATENT

1. Jun Wang, Guoqing Wang, Kairui Wang, Wenkai Du. "A Stereo Imaging and Recognition System for Hand Veins." *CN104217195A*, granted in Feb 2018.[link]

ACADEMIC SERVICES

- **Reviewer for the following journals**: International Journal of Computer Vision, IEEE Transactions on Image Processing, IEEE Transactions on Information Forensics and Security, Computer Vision and Image Understanding, IEEE Transactions on Circuits and Systems for Video Technology, IEEE Signal Processing Letters, Pattern Recognition Letters, Infrared Physics & Technology, KSII Transactions on Internet and Information Systems.
- **Reviewer for the following conferences**: CVPR'20, ECCV'20, IJCAI'19, AAAI'19, ACM MM'19.
- **Teaching Assistant** at CUMT for: Digital Image Processing in Spring 2015, Pattern Recognition and Artificial Intelligence in Fall 2016, and Robot Vision in Fall 2016.

INVITED TALKS

5. "Entangled Representation Learning for Single Image De-Raining", *ICCV*, Seoul/Korea, Oct 2019.
4. "Using Convolutional Neural Network to Learn Representation from Images and for Images", *University of New South Wales*, Sydney/Australia, Aug 2019.
3. "Sparse Coding of Deep Relational and Residual Descriptors for Vein Recognition", *CSIRO Data61*, Sydney/Australia, Dec 2018.

2. "Discriminative Representation Learning with Insufficient Data", *University of New South Wales*, Sydney/Australia, Sep 2018.

1. "Discriminative and Generative Image Modelling with CNN", *China University of Mining and Technology*, Xuzhou/China, Jun 2018.

MENTORING, LEADERSHIP & ACTIVITIES

- **Secretary of International Federation of Engineering Robots** (Jun. 2013-Present): Responsible for organizing "RoboWork", and RoboCup Seminars.
- **Chair of Robot Association in China University of Mining and Technology** (Jun. 2012-Jun. 2014): Responsible for organizing CUMT's Robot Competition with over 500 participants and CUMT's Scientific Innovation Competition with over 1000 participants.
- **Chair of Student Association in School of Information and Control Engineering at China University of Mining and Technology** (Jun. 2012-Jun. 2013): Leading over 200 students to organize different kinds of student activities and competitions at school of information and control engineering in CUMT.
- **Volunteer Leader for NXP Smart Car Competition** (Jun. 2012): Leading over 100 student volunteers to serve for participants at NXP Smart Car Competition.
- **Student Research Mentor** (Jun. 2017-Present): Zaiyu Pan (pursuing the Ph.D. degree at CUMT, and currently a visiting postgraduate student at CSIRO, Data61).