Shenghua He

Email: shenghuahe@wustl.edu
Homepage: shenghh2015.github.io
Google scholar: scholar.google.com/shenghuahe

BIOGRAPHY

I am currently a **senior research scientist** at PAII Inc., CA, working on 3D geometry, object detection and tracking, video understanding, and deep learning. I received my Ph.D. degree in computer science from Washington University in St. Louis in Dec. 2021. From Apr. 2019 to Dec. 2021, I was a visiting Ph.D. student at University of Illinois Urbana-Champaign (UIUC), where I was co-advised by **Prof. Mark Anastasio**, leading the Computational Imaging Science Laboratory, and **Prof. Hua Li**, leading the Medical Imaging and Bioinformatics Lab. In my Ph.D. studies, I worked on computer vision problems, such as object counting, detection, semantic object segmentation, and image classification, for biomedical image analysis.

Research interests: computer vision, biomedical image analysis, deep learning, and machine learning

EDUCATION

Washington University in St. Louis, St. Louis, MO Aug. 2016 - Dec. 2021
Ph.D. in Computer Science
Advisors: *Prof.* Mark A. Anastasio, *Prof.* Hua Li

Beijing University of Posts and Telecommunications, Beijing, China Sep. 2012 - Mar. 2015
M.E. in Electronics and Communications Engineering
Advisor: Xiangming Wen

Wuhan University of Technology, Wuhan, China Sep. 2008 - Mar. 2012
B.E. in Electronic Science and Technology

WORK EXPERIENCE

PAII Inc. (PingAn Technology US Research Lab), Pola Alto, CA Dec. 2021 - present
Senior research scientist

University of Illinois Urbana-Champaign, Urbana, IL Apr. 2019 - Dec. 2021
Visiting Ph.D. student
Advisors: *Prof.* Mark A. Anastasio, *Prof.* Hua Li

AWARDS

- Honor (top 15 %), Department of Computer Science, WashU, 2020 - 2021
- China National Scholarship (top 0.2%), Ministry of Education, China, 2013 - 2014

PUBLICATIONS

Summary: 12 Journal papers, 13 conference papers, and 10 posters and abstracts

Journals (‘*’ *indicates equation contribution*)

1. Xi Chen, Mikhail E. Kandel, **Shenghua He**, Chenfei Hu, Young Jae Lee, Kathryn Sullivan, Gregory Tracy, Hee Jung Chung, Hyun Joon Kong, Mark Anastasio, and Gabriel Popescu, “Artificial confocal microscopy for deep label-free imaging", *Nature Phonotics*, Accepted in Oct 2022, **impact factor 38.77**
2. Michael Fanous, **Shenghua He**, Sourya Sengupta, Krishnarao Tangella, Nahil Sobh, Mark A Anastasio, and Gabriel Popescu, “White blood cell detection, classification and analysis using phase imaging with computational specificity", *Scientific Reports*, 2022, **impact factor 4.996**

3. Yuchen He*, **Shenghua He***, Mikhail E Kandel*, Young Jae Lee, Chenfei Hu, Nahil Sobh, Mark A Anastasio, and Gabriel Popescu, “Cell cycle stage classification using phase imaging with computational specificity", *ACS Photonics*, 2022, **impact factor 7.5**

4. Chenfei Hu*, **Shenghua He***, Young Jae Lee, Yuchen He, Edward Minjae Kong, Hua Li, Mark A. Anastasio, and Gabriel Popescu. “Live-dead assay on unlabeled cells using phase imaging with computational specificity", *Nature Communication*, 2022. (**impact factor 14.92**)

5. Maliazurina Saad*, **Shenghua He***, Wade Thorstad, Hiram Gay, Su Ruan, Xiaowei Wang, and Hua Li, “Learning-based Cancer Treatment Outcome Prognosis using Multimodal Biomarkers", IEEE Transactions on Radiation and Plasma Medical Sciences, 2021

6. **Shenghua He**, Chunfeng Lian, Wade Thorstad, Hiram Gay, Yujie Zhao, Su Ruan, Xiaowei Wang, and Hua Li, “A novel systematic approach for cancer treatment prognosis and its applications in oropharyngeal cancer with microRNA biomarkers", *Bioinformatics*, 2021, **impact factor 6.94**

7. **Shenghua He**, Kyaw Thu Minn, Lilianna Solnica-Krezel, Mark A. Anastasio, and Hua Li. “Deeply-supervised density regression for automatic cell counting in microscopy images", *Medical Image Analysis*, 2021, **impact factor 13.8**

8. Kyaw Thu Minn, Yuheng C. Fu, **Shenghua He**, Sabine Dietmann, Steven C. George, Mark A. Anastasio, Samantha A. Morris, and Lilianna Solnica-Krezel, “High-resolution transcriptional and morphogenetic profiling of cells from micropatterned human ESC gastruloid cultures", *Elife*, 2020, **impact factor 8.14**

9. **Shenghua He***, Jian Wu*, Chunfeng Lian, H. Michael Gach, Sasa Mutic, Walter Bosch, Jeff Michalski, and Hua Li, “An Adaptive Low-Rank Modeling-based Active Learning Method for Medical Image Annotation", *Innovation and Research in BioMedical Engineering (IRBM)*, 2020, **impact factor 5.5**.

10. Yan Zhuang, Lei Yu, Haiying Shen, William Kolodzey, Nematollah Iri, Gregori Caulfield, and **Shenghua He**, “Data collection with accuracy-aware congestion control in sensor networks", *IEEE Transactions on Mobile Computing*, 2018, **impact factor 6.07**

11. Jun Zhao, Zhaoming Lu, Xiangming Wen, Haijun Zhang, **Shenghua He**, and Wenpeng Jing. “Resource management based on security satisfaction ratio with fairness-aware in two-way relay networks." *International Journal of Distributed Sensor Networks*, 2015, **impact factor 2.41**

12. **Shenghua He**, Zhaoming Lu, Xiangming Wen, Zhicai Zhang, Jun Zhao, and Wenpeng Jing. “A pricing power control scheme with statistical delay QoS provisioning in uplink of two-tier OFDMA femtocell networks." *Mobile Networks and Applications*, 2015, **impact factor 3.4**

Conferences

1. Tang, Youbao, Ning Zhang, Yirui Wang, **Shenghua He**, Mei Han, Jing Xiao, and Ruei-Sung Lin,“Accurate and Robust Lesion RECIST Diameter Prediction and Segmentation with Transformers", In International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI), 2022.

2. Zong Fan, **Shenghua He**, Su Ruan, Xiaowei Wang, and Hua Li, “Deep learning-based multi-class COVID-19 classification with x-ray Images", *Proc. of SPIE Medical Imaing*, 2021.

3. **Shenghua He**, Weimin Zhou, Hua Li, and Mark A. Anastasio, “Learning numerical observers using unsupervised domain adaptation," *Proc. of SPIE Medical Imaging*, 2020.

4. **Shenghua He**, Kyaw Thu Minn, Lilianna Solnica-Krezel, Hua Li, and Mark Anastasio. “Automatic microscopic cell counting by use of unsupervised adversarial domain adaptation and supervised density regression", *Proc. of SPIE Medical Imaging*, 2019.

5. **Shenghua He**, Kyaw Thu Minn, Lilianna Solnica-Krezel, Mark Anastasio, and Hua Li. “Automatic microscopic cell counting by use of deeply-supervised density regression model", *Proc. of SPIE Medical Imaging*, 2019.

6. **Shenghua He**, Jie Zheng, Akiko Maehara, Gary Mintz, Dalin Tang, Mark Anastasio, and Hua Li. "Convolutional neural network based automatic plaque characterization for intracoronary optical coherence tomography images", *Proc. of SPIE Medical Imaging*, 2018.

7. **Shenghua He**, Haiying Shen, Vivekgautham Soundararaj, and Lei Yu. "Cloud Assisted Traffic Redundancy Elimination for Power Efficiency in Smartphones", *Proc. of IEEE 15th International Conference on Mobile Ad Hoc and Sensor Systems (MASS)*, 2018.

8. Shen, Haiying, **Shenghua He**, Lei Yu, and Ankur Sarker. "Prediction-based redundant data elimination with content overhearing in wireless networks", *Proc. of IEEE International Conference on Pervasive Computing and Communications (PerCom)*, 2017.

9. **Shenghua He**, Ling Zhang, Xiangming Wen, Zhicai Zhang, Zhaoming Lu, and Yong Sun."Price-based power control with statistical delay QoS guarantee in two-tier femtocell networks", *Proc. of IEEE International Conference on Telecommunications (ICT)*, 2014.

10. Zhang, Ling, Xiangming Wen, Ting Xu, Zhaoming Lu, Jun Zhao, and **Shenghua He**. "Coordinated Scheduling in Downlink Multi-Cell OFDMA Networks", *Proc. of IEEE 80th Vehicular Technology Conference (VTC2014-Fall)*, 2014.

11. **He, Shenghua**, Zhaoming Lu, Xiangming Wen, Zhicai Zhang, Yong Sun, and Ling Zhang. "Energy-efficient power allocation with QoS guarantee in OFDMA wireless networks", *Proc. of IEEE International Symposium on Wireless Personal Multimedia Communications (WPMC)*, 2014.

12. Zhang, Zhicai, Xiangming Wen, Zhengfu Li, **Shenghua He**, Wenpeng Jing, and Jun Zhao. "QoS-aware energy-efficient power control in two-tier femtocell networks based on Q-learning." *In 2014 21st International Conference on Telecommunications (ICT), pp. 313-317. IEEE*, 2014.

13. Zhang, Ling, **Shenghua He**, Xiangming Wen, Zheng Wei, Jun Zhao, and Zhiqun Hu. "Network MIMO with decision tree classification in downlink OFDMA networks."*In 2014 21st International Conference on Telecommunications (ICT), pp. 22-26. IEEE*, 2014.

Posters and Abstracts (*'*' indicates equation contribution*)

1. Zong Fan, **Shenghua He**, Ethan Chen, Su Ruan, Xiaowei Wang, and Hua Li, "Multi-class classification based on multi-loss strategy and auxiliary deep learning network with applications in medical imaging", *AAPM Annual Meeting*, 2021.

2. Chenfei Hu*, **Shenghua He***, Young Jae Lee, Yuchen R. He, Mark Anastasio, and Gabriel Popescu, "Label-free cell viability assay using phase imaging with computational specificity (PICS)", *SPIE Photonics West BiOS*, 2021.

3. Yuchen R. He*, **Shenghua He***, Mikhail E. Kandel*, Young Jae Lee, Nahil Sobh, Mark Anastasio, and Gabriel Popescu, "Cell cycle detection using phase imaging with computational specificity (PICS)", *SPIE Photonics West BiOS*, 2021.

4. Xi Chen, Mikhail Kandel, **Shenghua He**, Young Jae Lee, Kathryn Sullivan, Hyun Joon Kong, Mark Anastasio, and Gabriel Popescu. "Laser scanning GLIM (LS-GLIM) for label-free imaging of turbid samples", *SPIE Photonics West BiOS*, 2021.

5. Fu Li, Umberto Villa, Seonyeong Park, **Shenghua He**, Mark A. Anastasio, "A framework for ultrasound computed tomography virtual imaging trials that employs anatomically realistic numerical breast phantoms", *SPIE Medical Imaing*, 2021.

6. **Shenghua He**, Weimin Zhou, Kaiyan Li, Mark Anastasio, and Hua Li, "Quantitative Performance Analysis of Supervised Transfer Learning and Unsupervised Domain Adaptation Methods Employed in Medical Imaging Applications", *Joint AAPM/COMP Meeting*, 2020.

7. Kaiyan Li, Weimin Zhou, **Shenghua He**, Hua Li, and Mark Anastasio, "Supervised Learning-Based Ideal Observer Approximation for Joint Detection and Estimation Tasks", *Joint AAPM/COMP Meeting*, 2020.

8. Maliazurina Saad, **Shenghua He**, Wade Thorstad, Hiram Gay, Xue Wu, Su Ruan, Yujie Zhao, Xiaowei Wang, and Hua Li, “Multimodal Biomarkers for Cancer Treatment Outcome Prediction by Use of Deep Learning and Canonical Correlation Analysis", *Joint AAPM/COMP Meeting*, 2020.
9. Maliazurina Saad, **Shenghua He**, Wade Thorstad, Hiram Gay, Xue Wu, Su Ruan, Yujie Zhao, Xiaowei Wang, and Hua Li, “Leveraging Incomplete Multimodal Biomarkers for Cancer Treatment Outcome Prediction", *Joint AAPM/COMP Meeting*, 2020.
10. **Shenghua He**, Ziyao Yi, Su Ruan, Mark Anastasio, Sasa Mutic, Hiram Gay, Wade Thorstad, Xiaowei Wang, Hua Li,“MicroRNA-Based Survival and Relapse Prognosis for Oropharyngeal Cancer Treatment by Use of Cox Regression and Belief Function Theory", *AAPM anual meeting*, 2019.

PROFESSIONAL SERVICES

- **Journal Reviewer**: Medical Image Analysis, Pattern Recognition, IEEE Access, Artificial Intelligence in Medicine, IEEE Intelligent Systems, Neurocomputing, Journal of Combinatorial Optimization, Medical Physics, IEEE Journal of Biomedical and Health Informatics, Journal of Biomedical Optics, IEEE Internet of Things Journal.
- **Conference Reviewer**: The AAAI Conference on Artificial Intelligence (AAAI), Special Interest Group on Knowledge Discovery and Data Mining (SIGKDD), Medical Image Computing and Computer Assisted Interventions (MICCAI).