

## Weihua Zhou, PhD

Tenure-Track Assistant Professor at The Department of Applied Computing, Michigan Technological University  
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## Summary

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### RESEARCH

- Dr. Zhou's research is dedicated to medical imaging and informatics, particularly, designing and developing **machine learning-based approaches to integrate multi-source information to optimize clinical decision making and improve patient management of complicated chronic diseases.**
- Three projects in Dr. Zhou's lab are being supported by NIH. **His total externally funded budget is \$1,026,492 (from NIH: \$1,008,100) after he joined Michigan Tech.**
- **Research publications:** Dr. Zhou has published 90 journal papers and 12 conference papers. **57 peer-reviewed journal papers were published on after he joined Michigan Tech.** His papers were published on top-tier journals, such as Information Fusion (1 count, IF 14.7), Pattern Recognition (2 counts, IF 7.5), *European Journal of Nuclear Medicine and Molecular Imaging* (2 counts, IF: 8.6), Computers in Biology and Medicine (5 counts, IF: 7.0), and Journal of Nuclear Cardiology (27 counts, IF: 3.0).
- **Dr. Zhou's total citations: 1,851 (as of 08/03/2024).** See his [Google Scholar Link](#).
- Dr. Zhou would like to highlight:
  - NIH 1R15HL172198 (PI: Weihua Zhou, total budget: \$427,307; [link](#)) 12/20/2023-11/30/2026  
Title: Multi-modality image fusion to improve coronary revascularization in patients with stable coronary artery disease
  - NIH 1R15HL173852 (PI: Qiuying Sha, total budget: \$429,153; [link](#)) 08/01/2024- 07/31/2026  
Title: Integrative analysis of electrical and mechanical dyssynchrony to improve cardiac resynchronization therapy (Note: **Dr. Zhou was the only PI in this proposal** when it was submitted to NIH. However, his other R15 (1R15HL172198) is funded. Because each PI is allowed to have only one active R15, the PI has been transferred to Dr. Sha)

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### TEACHING

Dr. Zhou has taught 13 lecture courses at MTU. **His teaching evaluation is 4.43 on average.** In May 2023, he received a **"top-10%" letter** from the MTU provost for the course SAT 4650 he taught.

### Students Dr. Zhou mentored/ supported at MTU

- Dr. Zhou graduated **3 PhD students** (Haipeng Tang, Zhuo He, and Chen Zhao) and co-mentored 5 PhD students. He has two new PhD students (Rochak Dhakal and Abhilash Das).
- Dr. Zhou supported 6 master's students (Pukar Baral, Anjum Shaik, Kristoffer Larsen, Goutham Thota, Chibuike Nwokefor, Ifunanya Ezeumeh) and 8 undergraduate students (Kristoffer Larsen, Drew Pienta, Gabriel Baquerizo, Noah Painter, Sean Phelan, Aili Toyli, Hannah Kilpatrick, Kiana Prany).
- **Highlights.** (1) Chen (2019-2023) received **Michigan Tech Dean's Award for Outstanding Scholarship** and is working as a **Tenure-Track Assistant Professor at Kennesaw State University** Department of Computer Science. (2) Chen, Kristoffer, and Pukar received the **MTU HRI Graduate Fellowship** awards. (3) Gabriel and Sean received the **MTU Summer Undergraduate Research Fellowship (SURF)** awards. Drew, Kris, Gabriel, Sean, and Aili received the **MTU Undergraduate Research Internship Program (URIP)** awards.

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### SERVICE

- **Professional service:**
  - Reviewed 39 papers for academic journals including IEEE Transactions on Medical Imaging, Pattern Recognition, Medical Image Analysis, and Journal of Nuclear Cardiology, from 2017 to 2024.
  - Reviewed grant proposals for AHA and Institute of Clinical and Translational Science (ICTS) at UCI.
  - Invited to give research talks for ASNC 2019 and SNMMI 2023.
  - Translated the abstracts of 34 selected papers for the Journal of Nuclear Cardiology from 2016-2023.
- **University and department service:**
  - Managing the Department of Applied Computing GPU Cluster, since March 2024.
  - Served in 1) the faculty search committees (Cybersecurity and Health Informatics) (2023 and 2024); 2) department charter committee (spring 2024); 3) the Graduate Dean's Award Awards Advisory Committee 2020-2022.

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Affiliated Assistant Professor at Department of Computer Science

Affiliated Assistant Professor at Department of Biomedical Engineering

Affiliated Assistant Professor at Department of Mathematical Sciences

Affiliated Assistant Professor at Department of Electrical and Computer Engineering

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### **EDUCATION AND TRAINING**

<b>Post-Doc</b>	<b>Emory University</b>	9/2012 - 8/2015
Department of Radiology and Imaging Sciences		
<b>Ph.D.</b>	<b>Southern Illinois University Carbondale</b>	1/2008 - 8/2012
Department of Electrical and Computer Engineering		
<b>MSc - Ph.D.</b>	<b>Wuhan University, China</b>	9/2003 - 12/2007
Department of Computer Science		
<b>B.E.</b>	<b>Wuhan University, China</b>	9/1999 - 6/2003
Computer Science and Technology from the Department of Computer Science (minor)		
Printing Engineering from the Department of Printing and Packaging (major)		

### **RESEARCH EXPERIENCE**

<b>Tenure-Track Assistant Professor</b>	Michigan Technological University	8/2019 – present
<b>Nina Bell Suggs Endowed Professor; Tenure-Track Assistant Professor</b>	University of Southern Mississippi	8/2015 – 7/2019
<b>Research Intern</b>	Philips Research North America, New York	3/2012 - 7/2012
Main project: lung imaging (patient-specific radiation optimization)		
<b>Research Intern</b>	Philips Research North America, New York	5/2011 - 8/2011
Main project: FEM simulation of ultrasound propagation to predict ultrasound-tissue interaction		

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### **RESEARCH GRANTS (Extramural)**

#### **Ongoing Research Support**

- NIH/ NHLBI R15** (1R15HL172198; total budget: \$427,307; [link](#)) 12/20/2023-11/30/2026  
**Title:** Multi-modality Image Fusion to Improve Coronary Revascularization in Patients with Stable Coronary Artery Disease  
**Role:** PI (co-Is: Dr. Jingfeng Jiang from BME and Dr. Saurabh Malhotra from Cook County Health)
- NIH U19 subcontract** (U19AG055373; total budget: \$151,640) 09/01/2019 –06/30/2025  
**Title:** Trans-omics integration of multi-omics studies for male osteoporosis  
**Role:** PI (in collaboration with Dr. Hong-Wen Deng at Tulane University)  
**Budget:** 2019: \$24,497; 2020: \$24,497; 2021: \$20,145; 2022 & 2023: \$48,143; 2024: \$34,358; total: \$151,640)
- NIH/ NHLBI R15** (1R15HL173852; total budget: \$429,153; [link](#)) 08/01/2024- 07/31/2026  
**Title:** Integrative analysis of electrical and mechanical dyssynchrony to improve cardiac resynchronization therapy  
**Role:** co-I (PI: Dr. Qiuying Sha from MTU Math and Dr. Saurabh Malhotra from Cook County Health)  
**Note:** Dr. Zhou was the only PI in this proposal when it was submitted to NIH. However, his other R15 (1R15HL172198) is funded. Because each PI is allowed to have only one active R15, the PI has been transferred to Dr. Sha.

#### **Extramurally funded proposals that are under review:**

- NIH/ NIBIB R21** (1R21EB037261-01; requested budget: \$603,448) 04/01/2025- 03/31/2027  
**Title:** Virtual quantification of coronary fractional flow reserve using multi-view videos of invasive coronary angiography

**Role:** PI (co-Is: Michele Esposito from Medical University of South Carolina, Saurabh Malhotra from Cook County Health, Chen Zhao from Kennesaw State University)

**2. NIH/ NIA R01 (1R01AR085684-01; request budget: \$3,708,351) 07/01/2025- 06/30/2030**

**Title:** Multi-modality information fusion to improve hip fracture risk assessment

**Role:** PI (co-Is: Qiuying Sha from MTU Math, Joyce Keyak from UCI, Nancy Lane from UCD, Hong-Wen Deng from Tulane University, and Vilmundur Gudnason from Icelandic Heart Association)

**Extramurally funded proposals that has been reviewed and will be resubmitted:**

**1. NIH/ NIA R15 (1R15AG087007; requested budget: \$423,057) 04/01/2024 - 03/31/2027**

**Title:** Risk assessment of hip fracture using multi-source information fusion

**Role:** PI (co-Is: Qiuying Sha from MTU Math and Hong-Wen Deng from Tulane University)

**Note:** This proposal was unfunded, but it will be resubmitted based on the promising impact score (37) in the last submission.

**Completed**

**1. SynterMed Inc. (total budget: \$18,392) 05/01/2023-01/31/2024**

**Title:** Development and validation of a deep-learning-based method for automated reorientation of PET myocardial perfusion images

**Role:** PI

**2. AHA AIREA (17AIREA33700016; total budget: \$153,794) 7/1/2017-6/30/2019**

**Title:** A new image-guided approach for cardiac resynchronization therapy

**Role:** PI (co-I: Dr. Chaoyang Zhang from University of Southern Mississippi)

**3. Ochsner Foundation Hospital at New Orleans, LA (total budget: \$15,300) 6/1/2017-5/31/2018**

**Title:** Improving the clinical values of Rb-82 PET myocardial perfusion imaging and quantification of myocardial blood flow for the diagnosis, prognosis, and treatment of coronary artery disease

**Role:** PI (co-I: Dr. Robert Bober at Ochsner Medical Center)

**4. AHA Post-Doc Fellowship (15POST22690035) 1/1/2015-8/18/2015**

**Title:** 3D Navigation and Image Fusion for Targeted LV Lead Placement to Guide CRT.

**Role:** PI (The grant was terminated because the PI got a faculty position in another institute)

**RESEARCH GRANTS (Internal in Michigan Technological University)**

**1. MTU ICC ICC Rapid Seedling Award 11/01/2024-05/30/2025**

**Title:** AngioReady: a digital simulation platform with mixed reality for medical trainees and staff to learn invasive coronary angiography

**Role:** PI (co-PI: Dan Ye)

**2. MTU PHF-REF-RS 07/01/2024-06/30/2025**

**Title:** Integrating Biopsychosocial Dynamics to Optimize ACL Injury Recovery: A Longitudinal Person-Centered Modeling Approach

**Role:** Co-I (PI: Erich Petushek from *Cognitive and Learning Sciences, Michigan Tech*)

**3. Michigan Tech Health Research Institute Seed Grant 11/01/2020-06/30/2021**

**Title:** Non-invasive assessment of coronary fractional flow reserve on fluoroscopy angiograms

**Role:** PI (co-PI: Jingfeng Jiang)

**4. MTU PHF-REF-RS 07/01/2020-06/30/2021**

**Title:** Deep learning applied to electrical signals from a wearable ECG device to improve cardiac resynchronization therapy for patients with heart failure

**Role:** PI (co-investigators: Timothy Havens, Qing-hui Chen)

5. MTU ICC COVID-19 Research Seed Grant 05/01/2020-08/31/2020  
**Title:** KD4COVID19: an open research platform using feature engineering and machine learning for knowledge discovery and risk stratification of COVID-19  
**Role:** PI (co-investigator: Jinshan Tang)

6. MTU Research Excellence: Infrastructure Enhancement Grants 1/1/2020-12/31/2020  
**Title:** Building big data computing capabilities toward advancing research and education  
**Role:** co-investigator (PI: Dr. Jinshan Tang)

### **Graduate/ Undergraduate Student Fellowships (Dr. Zhou's Lab Students in Michigan Tech)**

1. MTU HRI Graduate Fellowship Fall 2024  
**Title:** Development and validation of a new deep learning based method to estimate fractional flow reserve from invasive coronary angiography  
**Role:** Awardee's advisor (Master's student: Pukar Baral)

2. MTU Undergraduate Research Internship Program 2024-2025  
**Title:** A Statistical Machine Learning Approach for Enhancing Risk Prediction of Alzheimer's Disease Utilizing Clinical, Genetic, and Neuroimaging Data  
**Role:** Awardee's advisor (undergraduate student: Sean Phelan; co-advisor: Qiuying Sha)

3. MTU Undergraduate Research Internship Program 2024-2025  
**Title:** Statistical Analysis of the Heart-Brain Connection Using Cardiovascular Magnetic Resonance Imaging, Positron Emission Tomography, and Genetic Markers  
**Role:** Awardee's advisor (undergraduate student: Aili Toyli; co-advisor: Qiuying Sha)

4. MTU Summer Undergraduate Research Fellowship Summer 2024  
**Title:** Discovering Genetic Markers for Alzheimer's Disease Using Genome-Wide Association and Rare Variant Association Studies for Risk Prediction  
**Role:** Awardee's advisor (undergraduate student: Sean Phelan; co-advisor: Qiuying Sha)

5. MTU Undergraduate Research Internship Program 2023-2024  
**Title:** Identifying and Quantifying Parameters Related to Hip Fracture from DXA Images  
**Role:** Awardee's advisor (undergraduate student: Gabriel Baquerizo; co-advisor: Qiuying Sha)

6. MTU Health Research Institute Graduate Fellowship Fall 2023  
**Title:** New methods utilizing deep unsupervised and reinforcement learning to improve the clinical decision-making process for cardiac resynchronization therapy (CRT)  
**Role:** Awardee's advisor (Master's student: Kristoffer Larsen; co-advisor: Qiuying Sha)

7. MTU Summer Undergraduate Research Fellowship Summer 2023  
**Title:** Discovering Hip Fracture Genetic Variations with Genome Wide Association and Rare Variant Association for Risk Prediction  
**Role:** Awardee's advisor (undergraduate student: Gabriel Baquerizo; co-advisor: Qiuying Sha)

8. MTU Undergraduate Research Internship Program 2022-2023  
**Title:** Machine Learning to Support Clinical Decision Making of Cardiac Resynchronization Therapy for Late-Stage Heart Failure Patients  
**Role:** Awardee's advisor (undergraduate student: Kristoffer Larsen; co-advisor: Qiuying Sha)

9. MTU Health Research Institute Graduate Fellowship Fall 2022  
**Title:** New methods using deep learning for medical image segmentation and multi-source information fusion  
**Role:** Awardee's PhD advisor (PhD student: Chen Zhao)

10. MTU Undergraduate Research Internship Program 2020-2021

Title: Image Segmentation Using Deep Learning to Support Clinical Decision Making for Aortic Dissection Surgery

Role: Awardee's advisor (undergraduate student: Drew Pieta)

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## **PUBLICATIONS AND PATENTS** (\*: corresponding author[s])

### **Preprint, under review, or in revision**

1. Nan J, Fan G, Zhang K, Li D, Xia Y, Yao N, Han C, Zhao C, Zhu F, **Zhou W**. A pyramid learning network for brain image registration based on gradient and differential features. 2024. [arXiv:2410.18228]  
Preprint: <http://arxiv.org/abs/2410.18228>
2. Tao L, Xie Y, Deng J, Shen H, Deng HW, **Zhou W**, Zhao C\*. SGUQ: Staged Graph Convolution Neural Network for Alzheimer's Disease Diagnosis using Multi-Omics Data. 2024. [arXiv: 2410.11046]  
Preprint: <https://arxiv.org/abs/2410.11046>
3. Tong K, Wang L, Yuan K, Wei Q, Cheng X, Tang S, Deng HW, Zhao C, Zhou W. An analysis on femoral morphological characteristics with quantitative CT images: statistical shape modeling, classification and semantic segmentation. 2024.
4. Toyli A, Hung GU, Zhao C, Sha Q, Chiu PY\*, **Zhou W\***. Comparison of Cerebral ECD Perfusion in Patients with Dementia with Lewy Bodies and Parkinson's Disease Dementia. 2024. [DOI: 10.1101/2024.10.02.24314782][ R15HL172198][ R15HL173852]
5. Jiang Z, Zhao Z, He Z, Chen Q, Bu J, Li C, Li D, Cui C, Qin H, Wang C\*, **Zhou W**. Predicting Cardiac Resynchronization Therapy Response: Development and Internal Validation of a SPECT-based Nomogram. 2024.
6. Azevedo GL, Painter N, He Z, Kristoffer L, Sha Q, Zou J, Peix A, Mesquita CT\*, **Zhou W\***. Clinical phenotypes among patients that underwent cardiac resynchronization therapy using unsupervised learning integrating gated SPECT. 2024.
7. Zhao C, Xu Z, Baral P, Esposito M, **Zhou W\***. Multi-graph Graph Matching for Coronary Artery Semantic Labeling. 2024. [arXiv:2402.15894]  
Preprint: <https://arxiv.org/abs/2402.15894>
8. Tang S\*, Miao P, Gao X, Zhong Y, Zhu D, Wen H, Xu Z\*, Wei Q, Yao H, Huang X, Goa R, Zhao C, **Zhou W**. Point cloud-based registration and image fusion between cardiac SPECT MPI and CTA. 2024. [arXiv:2402.06841]  
Preprint: <https://arxiv.org/abs/2402.06841>
9. Huang H, Qiu L, Yang S, Li L, Nan J, Li Y, Han C, Zhu F\*, Zhao C\*, **Zhou W**. Vision Transformer-based Multimodal Feature Fusion Network for Lymphoma Segmentation on PET/CT Images. 2024.  
Preprint: <https://arxiv.org/abs/2402.02349>
10. Tang S, Zhu D, Wen H, Wei Q, Huang X, Cao R, Hung GU, Zhao M, Jiang Z, Zhao C\*, **Zhou W**. Cardiac SPECT Image Segmentation Based on U-Net Model with Federated Learning. Submitted to Journal of Information Systems and Telecommunication. 2024.
11. Larsen K, Zhao C, Keyak J, Sha Q, Paez D, Zhang X, Zou J\*, Peix A\*, **Zhou W\***. A new method of modeling the multi-stage decision-making process of CRT using machine learning with uncertainty quantification. [arXiv:2309.08415] [1R15HL172198]  
Preprint: <https://arxiv.org/abs/2309.08415>
12. Xu Z, Malhotra S, Zhao C, Jiang J, Vij A, Ye Z, Hua R, Li C, Wang C\*, **Zhou W\***. 3D fusion between SPECT myocardial perfusion imaging and invasive coronary angiography to guide the treatment in patients with stable CAD. 2023. [DOI: 10.1101/2023.09.18.23295731]  
Preprint: doi: <https://doi.org/10.1101/2023.09.18.23295731>
13. Larsen K, He Z, Zhao C, Zhang X, Sha Q, Mesquita, CT, Garcia EV, Paez D, Zou J\*, Peix A\*, **Zhou W\***. A new method using deep learning to predict the response to cardiac resynchronization therapy. 2023. [arXiv:2305.02475] [1R15HL172198]  
Preprint: <http://arxiv.org/abs/2305.02475>

**Accepted**

## Published

### A. Peer-reviewed journal papers (\* corresponding author[s])

1. Zhao C, Esposito M, Xu Z, **Zhou W\***. HAGMN-UQ: Hyper Association Graph Matching Network with Uncertainty Quantification for Coronary Artery Semantic Labeling. *Medical Image Analysis*. 2024. [PMID: 39413456] [1R15HL172198] [1R15HL173852] [U19AG055373]
2. Yao N, Hu H, Chen K, Zhao C, Guo Y, Li B, Nan J, Li Y, Han C, Zhu F, **Zhou W\***, Tian L\*. A Robust Deep Learning Method with Uncertainty Estimation for the Pathological Classification of Renal Cell Carcinoma based on CT Images. *Journal of Imaging Informatics in Medicine*. 2024. [PMID: 39313716]
3. Yao N, Tian Y, das Neves DG, Zhao C, Mesquita CT, de Andrade Martins W, dos Santos AASMD, Li Y, Han C, Zhu F, Dai N\*, **Zhou W\***. Incremental Value and Interpretability of Radiomics Features of Both Lung and Epicardial Adipose Tissue for Detecting the Severity of COVID-19 Infection. *Kardiologija*. 2024;64(10). DOI: 10.18087/cardio.2024.10.n2685. 2024. [PMID: 39392272]
4. Baral P, Zhao C, Esposito M, **Zhou W\***. A review on machine learning for arterial extraction and quantitative assessment on invasive coronary angiograms. *Current Cardiovascular Imaging Reports*. 2024. [arXiv:2405.08474] [1R15HL172198]
5. Shaik A, Larsen K, Lane NE, Zhao C\*, Su KJ, Keyak JH, Tian Q, Sha Q, Shen H, Deng HW, **Zhou W\***. A Staged Approach using Machine Learning and Uncertainty Quantification to Predict the Risk of Hip Fracture. *Bone Reports*. 2024. [PMID: 39328352][PMCID: PMC11426051] [U19AG055373][1R15HL172198]
6. Zhao C, Su KJ, Wu C, Cao X, Sha Q, Li W, Luo Z, Qing T, Qiu C, Zhao LJ, Liu A, Jiang L, Zhang X, Shen H, **Zhou W\***, Deng HW\*. *Multi-Scale Variational Autoencoder for Imputation of Missing Values in Untargeted Metabolomics using Whole-Genome Sequencing Data*. *Computers in Biology and Medicine*. 2024. [PMID: 38955127][PMCID: PMC11324385] [U19AG055373] [1R15HL172198]
7. Zhou C, Xiao Y, Li L, Liu Y, Zhu F, **Zhou W**, Yi X, Zhao M\*. Radiomics nomogram derived from gated myocardial perfusion SPECT for identifying ischemic cardiomyopathy. *Journal of Imaging Informatics in Medicine*. 2024. [PMID: 38806952]
8. Si H, He Z, Malhotra S, Zhang X, Zou F, Xue S, Qian Z, Wang Y, Hou X, **Zhou W\***, Zou J\*. A novel method combining gated SPECT and vectorcardiography to guide left ventricular lead placement to improve response to cardiac resynchronization therapy: A Proof of Concept study. *Journal of Nuclear Cardiology*. 2024. [PMID: 38697386][DOI: 10.1016/j.nuclcard.2024.101867]
9. Yuan K, Wang L, Wei Q\*, Cheng X, Zhao C, Tang S, Deng HW, **Zhou W**. A deep learning approach based on two-channel 3DCNN networks to automatically predict the risk of femoral fracture using CT images. *Journal of Imaging Science and Technology*. 2024. [DOI : 10.2352/J.ImagingSci.Technol.2024.68.6.060502]
10. Zhu F, Tian Y, Han C, Li Y, Nan J, Yao N\*, **Zhou W\***. Model-level Attention and Batch-instance Style Normalization for Federated Learning on Medical Image Segmentation. *Information Fusion*. 2024. [DOI:10.1016/j.inffus.2024.102348]
11. Zhao C, Liu A, Zhang X, Cao X, Ding Z, Sha Q, Shen H, Deng HW\*, **Zhou W\***. CLCLSA: Cross-omics linked embedding with contrastive learning and self attention for integration with incomplete multi-omics data. *Computers in Biology and Medicine*. 2024. [PMID: 38295477] [PMCID: PMC10959569] [U19AG055373][1R15HL172198]
12. Cao X, Keyak JH, Sigurdsson S, Zhao C, **Zhou W**, Liu A, Lang TF, Deng HW, Gudnason V\*, Sha Q\*. A new hip fracture risk index derived from FEA-computed proximal femur fracture loads and energies-to-failure. *Osteoporosis International*. 2024. [PMID: 38246971][PMCID: PMC11069422] [U19AG055373]
13. He Z, Si H, Zhang X, Chen QH, Zou J\*, **Zhou W\***. A new method using deep transfer learning on ECG to predict the response to cardiac resynchronization therapy. *Medical Imaging Process & Technology*. 2023. [doi: 10.24294/mipt.v6i1.2798]
14. Zhao C, Keyak JH, Cao X, Sha Q, Tian Q, Qiu C, Su R, Wu L, Luo Z, Zhao L, Shen H, Deng HW\*, **Zhou W\***. Multi-view information fusion using multi-view variational autoencoder to predict proximal femoral fracture load. *Frontiers in Endocrinology Sec. Bone Research*. 2023. [PMID: 38075049] [PMCID: PMC10710145] [U19AG055373]

15. Meng Y, Du Z, Zhao C, Dong M, Pieta D, Tang J\*, **Zhou W\***. Automated extraction of coronary arteries using deep learning in invasive coronary angiograms. *Technology and Health Care*. 2023. [PMID: 37545276]
16. Zhao C, Shi S, He Z, Malhotra S, Wang C, Zhao Z, Li X, Wen H, Tang S, Zhou Y\*, **Zhou W\***. Spatial-temporal V-Net for automatic segmentation and quantification of right ventricle on gated myocardial perfusion SPECT images. *Medical Physics*. 2023. [PMID: 37860998]
17. Zhao C, Xu Z, Hung GU, **Zhou W\***. EAGMN: Coronary artery semantic labeling using edge attention graph matching network. *Computers in Biology and Medicine*. 2023. [PMID: 37725850] [U19AG055373]
18. Zhao Z, Wang C, Peng Z, Bu J, Li C, Li D, **Zhou W**, Lu R\*, Tang L\*, Li Y\*. The influence of arm positions on mechanical dyssynchrony measured by gated myocardial perfusion imaging. *Quantitative Imaging in Medicine and Surgery*. 2023. [PMID: 37869273] [PMCID: PMC10585576]
19. Lyu Z, King K, Rezaeitaleshmahalleh M, Pienta D, Mu N, Zhao C, **Zhou W**, Jiang J\*. Deep-learning-based Image Segmentation for Image-based Computational Hemodynamic Analysis of Abdominal Aortic Aneurysms: A Comparison Study. *Biomedical Physics & Engineering Express*. 2023. [PMID: 37625388]
20. Rezaeitaleshmahalleh M, Mu N, Lyu Z, **Zhou W**, Zhang X, Rasmussen TE, McBane II RD, Jiang J\*. Radiomic-based Textural Analysis of Intraluminal Thrombus in Aortic Abdominal Aneurysms: A Demonstration of Automated Workflow. *Journal of Cardiovascular Translational Research*. 2023. [PMID: 37407866]
21. Yao N, Li L, Gao Z, Zhao C, Li Y, Han C, Nan J, Zhu Z, Xiao Y, Zhu F, Zhao M\*, **Zhou W**. Deep Learning-Based Diagnosis of Disease Activity in Patients with Graves' Orbitopathy Using Orbital SPECT/CT. *European Journal of Nuclear Medicine and Molecular Imaging*. 2023. [PMID: 37395800] [PMCID: PMC10547836]
22. Zhao C, Xu Z, Jiang J, Esposito M, Pienta D, Hung GU, **Zhou W\***. AGMN: Association Graph-based Graph Matching Network for Coronary Artery Semantic Labeling on Invasive Coronary Angiograms. *Pattern Recognition*. 2023. [PMID: 37483334] [PMCID: PMC10358827] [U19AG055373]
23. Fernandes F, Larsen K, He Z, Nascimento E, Peix A, Sha Q, Paez D, Garcia EV, **Zhou W\***, Mesquita CT\*. A new method using machine learning to integrate ECG and gated SPECT MPI for Cardiac Resynchronization Therapy Decision Support. *European Journal of Nuclear Medicine and Molecular Imaging*. 2023. [PMID: 37195444][PMCID: PMC10959568] [17AIREA33700016]
24. Zhu F, Li L, Zhao J, Zhao C, Tang S, Nan J, Li Y, Zhao Z, Shi J, Chen Z, Han C, Jiang Z\*, **Zhou W\***. A new method incorporating deep learning with shape priors for left ventricular segmentation in myocardial perfusion SPECT images. *Computers in Biology and Medicine*. 2023. [PMID: 37130501]
25. Zhu F, Wang G, Zhao C, Malhotra S, Zhao M, He Z, Shi J, Jiang Z\*, **Zhou W\***. Automatic reorientation by deep learning to generate short-axis SPECT myocardial perfusion images. *Journal of Nuclear Cardiology*. 2023. [PMID: 36859594]
26. Song M, Greenbaum J, Joseph Luttrell J IV, **Zhou W**, Wu C, Luo Z, Qiu C, Zhao LJ, Su KJ, Tian Q, Shen H, Hong X, Gong P, Shi X, Deng HW, Zhang C. An autoencoder-based deep learning method for genotype imputation. *Frontiers in Artificial Intelligence, section Medicine and Public Health*. 2022. [PMID: 36406474] [PMCID: PMC9671213] [U19AG055373]
27. Meng Y, Dong M, Dai X, Tang H, Zhao C, Jiang J, Xu S, Zhou Y, Zhu F, Xu Z\*, **Zhou W\***. Automatic identification of end-diastolic and end-systolic cardiac frames from invasive coronary angiography videos. *Technology and Health Care*. 2022. [PMID: 35599518]
28. He Z, Zhang X, Zhao C, Ling X, Malhotra S, Qian Z, Wang Y, Hou X, Zou J\*, **Zhou W\***. A method using deep learning to discover new predictors from left-ventricular mechanical dyssynchrony for CRT response. *Journal of Nuclear Cardiology*. 2022. [PMID: 35915327] [PMCID: PMC10961110] [17AIREA33700016]
29. Zhu F, Gao Z, Zhao C, Zhu H, Tian Y, Dong Y, Jiang J, Dai N\*, **Zhou W\***. A Deep Learning-based Method to Extract Lumen and Media-Adventitia in Intravascular Ultrasound Images. *Ultrasonic Imaging*. 2022. [PMID: 35861418]
30. Zhao C, Tang H, McGonigle D, He Z, Zhang C, Wang YP, Deng HW, Bober R\*, **Zhou W\***. Development of an approach to extracting coronary arteries and detecting stenosis in invasive coronary angiograms. *Journal of Medical Imaging*. 2022. [PMID: 35875389] [PMCID: PMC9295705] [17AIREA33700016] [U19AG055373]
31. Wang C, Ma Y, Liu Y, Li Lo, Cui C, Qin H, Zhao Z, Li C, Ju W, Chen M, Li D\*, **Zhou W\***. Texture Analysis of SPECT Myocardial Perfusion Provides Prognostic Value for Dilated Cardiomyopathy. *Journal of Nuclear Cardiology*. 2022. [PMID: 35676551] [17AIREA33700016]

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#### **B. Peer-reviewed full-length conference papers (\* corresponding author[s])**

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10. **Zhou W\***, Huang J. A fast multi-level algorithm for drawing large undirected graphs. *Proc. ICICSE* 2008;110-117.
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### **C. Invited journal papers (\* corresponding author[s])**

1. Hung GU\*, **Zhou W**, Chen J. A perfect tool for comprehensive evaluation of myocardial perfusion and function: stress PET imaging. *Journal of Nuclear Cardiology*. 2018. (invited editorial) [PMID: 30603888]
2. Jiang Z\*, **Zhou W\***. Left ventricular mechanical dyssynchrony for CAD diagnosis: does it have incremental clinical values? *Journal of Nuclear Cardiology* 2018; 1-3. (invited editorial) [PMID: 30218216]
3. **Zhou W\***, Hung GU\*. Left-ventricular mechanical dyssynchrony in the prognosis of dilated cardiomyopathy: which parameter is more useful? *Journal of Nuclear Cardiology* 2017;1-4. (invited editorial) [PMID: 28361476]

### **D. Conference abstracts (published within the recent five years)**

#### **International/ national**

1. Zhao C, Esposito M, Jiang J, Xu Z, **Zhou W**. Automated Semantic Segmentation And Stenosis Detection Of Coronary Arteries On Invasive Coronary Angiograms Using Hypergraph Matching And Information Fusion. AHA Scientific Session. *Circulation*. 2023;148:A14804. [doi:10.1161/circ.148.suppl\_1.14804]
2. Xu Z, Malhotra S, Zhao C, Wang C, **Zhou W**. 3D Fusion between SPECT Myocardial Perfusion Imaging and Invasive Coronary Angiography to Guide Revascularization in Patients with Stable Coronary Artery Disease. AHA Scientific Session. *Circulation*. 2023;148:A13473. [doi:10.1161/circ.148.suppl\_1.13473]
3. Rezaeitaleshmahalleh M, Mu N, Lyu Z, **Zhou W**, Zhang X, Rasmussen TE, McBane II RD, Jiang J. Automated Radiomic-based Textural Analysis of Intraluminal Thrombus for Improving Growth Status Prediction of Aortic Abdominal Aneurysms. Golden Research Conference on Biomechanics in Vascular Biology and Disease. 2023.
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8. Wang C, Shi J, Zhao Z, Li C, Li D, **Zhou W**. Left ventricular systolic and diastolic dyssynchrony to predict cardiac resynchronization therapy response in heart failure patients with dilated cardiomyopathy. ASNC Scientific Session 2019.
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10. Zhang X, Qian Z, Tang H, Hua W, Su Y, Xu G, Liu X, Xue X, Fan J, Cai L, Zhu L, Wang Y, Hou X, Garcia EV, **Zhou W**, Zou J. A new method to recommend appropriate left-ventricular lead positions for improved cardiac resynchronization therapy volumetric response and long-term prognosis. Heart Rhythm Society (HRS) 2019.
11. Jiang Z, He Z, Zhu F, Tang H, Li D, Zhang C, **Zhou W**. Machine learning to diagnose CAD from SPECT MPI: a preliminary study. ASNC Scientific Session 2018. (interviewed by docguide.com)
12. Tang H, Tao N, Zhang C, Zou J, **Zhou W**. Identifying the predictive factors of cardiac resynchronization therapy response: a comparative study using machine learning and logistic regression analysis. AHA Scientific Session 2017.
13. Li D, Wang C, Tang H, Hung GU, **Zhou W**. Prognostic Value of LV Diastolic Dyssynchrony from SPECT MPI in Patients with DCM. ASNC Scientific Session 2017.

14. Tao N, Tang H, Qiu Y, **Zhou W**, Qian Z, Wang Y, Hou X, Zou J. Assessment of left ventricular contraction patterns using gated SPECT MPI to improve cardiac resynchronization therapy response. ACC Scientific Session 2017.
15. Zhou Y, Xu Y, Wang C, Jiang Z, Tang L, Li D, Hung GU, **Zhou W**. Development and validation of a quantification toolkit to diagnose apical hypertrophic cardiomyopathy from gated SPECT MPI. ASNC Scientific Session 2016.
16. Li D, Wang C, Danda C, Jackson A, Zhou Y, Chen J, **Zhou W**. Interventricular mechanical dyssynchrony as assessed by phase analysis of gated SPECT MPI in patients with WolffParkinsonWhite syndrome. SNMMI Scientific Session 2016.
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23. Chen J, **Zhou W**, Suever J, Oshinski J, Galt JR, Garcia EV. Development of a novel quantification tool to measure transmural scar border zone by resting Tc-99m SPECT myocardial perfusion imaging. SNM 2013.

#### **Regional**

24. Pienta D, Zhao C, **Zhou W**. Methods to Improve Deep Learning Based Automatic Coronary Extraction. Michigan Technological University Undergraduate Research Symposium. March 25, 2022.
25. Song M, Greenbaum J, Luttrell J, **Zhou W**, Wu C, Luo Z, Qiu C, Zhao LJ, Su KJ, Tian Q, Shen H, Gong P, Shi X, Zhang C\*, Deng HW\*. **Autoencoder-based Model for Genotype Imputation**. MSBIOS conference. 2022.
26. Pienta D, **Zhou W**. Automatic Segmentation of the Aorta using Deep Learning. Michigan Technological University Undergraduate Research Symposium. March 25, 2021.
27. Song M, Greenbaum J, Luttrell J, **Zhou W**, Deng HW, Zhang C. Imputation of Genome-Wide Association Study Data Using Autoencoders. MS IDeA conference. 2019.
28. McGonigle D, Zhao D, Tang H, Zhang C, He Z, Bober R, **Zhou W\***. Deep Learning to Extract Coronary Arteries from Fluoroscopy Angiography. Conference of Midsouth Computational Biology & Bioinformatics Society (MCBIOS '2019).
29. He Z, Tang H, McGonigle D, Zhang C, Jiang Z, **Zhou W\***. A Deep-Learning-Based Segmentation Method for Left Ventricle on Gated SPECT Myocardial Perfusion Images. Conference of Midsouth Computational Biology & Bioinformatics Society (MCBIOS '2019).

#### **E. Book chapters**

1. He Z, Garcia EV, **Zhou W\***. Chapter 25 - Nuclear Image-Guided Methods for Cardiac Resynchronization Therapy. Nuclear imaging guiding cardiac resynchronization therapy in Nuclear Cardiology: Basic and Advanced Concepts in Clinical Practice. Springer-Nature. Book chapter. 2021.
2. Chen Y, **Zhou W**, Dobbins JT III. Chapter 9 - Fourier-domain methods for optimization of tomosynthesis (NEQ). Book chapter, in *Tomosynthesis Imaging*, ed. I Reiser and S Glick, Taylor & Francis, 2014.

#### **F. Dissertations**

1. **Zhou W**. Image reconstruction and imaging configuration optimization with a novel nanotechnology enabled breast tomosynthesis multi-beam X-ray system. Ph.D. dissertation 2012. Southern Illinois University Carbondale.
2. **Zhou W**. Research on automatic graph drawing in straight lines. Ph.D. dissertation 2009. Wuhan University.

## **G. Patents and invention disclosures**

1. Ye D, **Zhou W**, Esposito M. AngioBase: An educational web-based tool for medical trainees and staff to interpret invasive coronary angiograms. Invention Disclosure. 2022. Michigan Technological University.
2. **Zhou W**, Zhao C. Automatic extraction of coronary arteries and measurement of fractional flow reserve in invasive coronary angiography. Invention Disclosure. 2022. Michigan Technological University.
3. **Zhou W**, Li D. A new method to diagnose apical hypertrophic cardiomyopathy from gated single photon emission computed tomography (SPECT). Invention Disclosure. 2016. University of Southern Mississippi.
4. **Zhou W**, Li D. A new method to measure right-ventricular and interventricular mechanical dyssynchrony from gated single-photon emission computed tomography (SPECT) myocardial perfusion imaging (MPI). Invention Disclosure. 2016. University of Southern Mississippi.
5. Chen J, **Zhou W**. Integration of fluoroscopy venogram and myocardial perfusion SPECT image with left-ventricular contraction sequence and scar distribution. Invention Disclosure. 2014. Emory University.
6. Ehsan DM, Joerg S, Bharat R, **Zhou W**. Breathing motion compensation during radiotherapy. US 61/891,521, international patent publication number: WO2015055485 A1. granted 2013P00689WEFR (2012ID02711). Philips.
7. Ehsan DM, Joerg S, Bharat R, **Zhou W**. System and method for lung motion prediction using a displacement driven finite element modeling scheme. Invention Disclosure. 2012. Philips.
8. Vignon F, Robert JL, **Zhou W**, Radescu E, Gijbers G. Multi-view real-time 3D transthoracic echocardiography for interventional guidance: device and methods. Invention Disclosure. 2011. Philips.

## **H. Invited research talks**

- Invited Speaker, Society of Nuclear Medicine and Molecular Imaging 2023 6/2023  
Title: Segmenting Cardiac Images With AI
- Invited Speaker, American Society of Nuclear Cardiology 2019 9/2019  
Title: Machine Learning in SPECT MPI Applications

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## **TEACHING EXPERIENCE**

Semester	Course #	Course Title	n=enr	n=resp	Overall evaluation
<b>Lecture courses I taught at University of Southern Mississippi, Fall 2015- Spring 2019</b>					
<u>Fall 2015</u>	CSC 620	Formal Methods	13	13	4.69
<u>Spring 2016</u>	CSC 638	Advanced Algorithms	13	13	4.58
<u>Fall 2016</u>	CSC 620	Formal Methods	4	4	4.25
	CSC 633	Distributed Database	2	2	5.00
	CSC 691	Digital Image Processing	6	4	4.00
<u>Spring 2017</u>	CSC 638	Advanced Algorithms	3	3	3.67
	CSC 623	Data Mining	3	3	3.67
<u>Fall 2017</u>	CSC 691-1	Digital Image Processing	3	1	5.00
	CSC 691-2	Machine Learning	3	1	5.00
<u>Spring 2018</u>	CSC 413	Algorithms	13	10	4.50
	CSC 634	Data Mining	3	2	5.00
<u>Fall 2018</u>	CSC 307	Data Structures	9	6	3.83
	CSC 611	Artificial Neural Networks	2	1	5.00
<u>Spring 2019</u>	CSC 413	Algorithms	20	14	4.36
	CSC 691	Machine Learning	2	2	5.00
<b>Lecture courses I taught at Michigan Technological Univ, Fall 2019-Spring 2024</b>					
<b>In-person or (online)</b>					
<u>Fall 2019</u>	SAT 5001	Intro to Health Informatics	3(2)	N/A - small class size	
<u>Spring 2020</u>	SAT 5990	Applied AI in Health	1(1)	N/A- COVID-19 Pandemic	
<u>Fall 2020</u>	SAT 3210	Database Management	26		
<u>Spring 2021</u>	SAT 5990	Applied AI in Health	(5)		

<u>Fall 2021</u>	SAT 4310	Advanced Scripting Programming	15		
	SAT 4650	Applied Computing in Python	(7)		
<u>Spring 2022</u>	SAT 5314	Applied ML in Healthcare	(3)		
<u>Fall 2022</u>	SAT 4650	Applied Computing in Python	29(13)	29(11)	4.53(4.08)
<u>Spring 2023</u>	SAT 4650	Applied Computing in Python	20(5)	20(5)	4.74(4.46)
	SAT 5114	AI in Healthcare	32	32	4.51
<u>Fall 2023</u>	SAT 4650	Applied Computing in Python	29(18)	26(16)	4.37(4.43)
<u>Spring 2024</u>	SAT 4650	Applied Computing in Python	17(5)	17(5)	4.49(3.89)
	SAT 5114	AI in Healthcare	25(9)	24(8)	4.71(4.52)
				Average: 4.43	

**Invited Speaker**, Tulane University 11/2017  
Department of Biomedical Engineering  
**Invited Speaker**, Georgia Institute of Technology 2/2013  
Department of Biomedical Engineering

## UNIVERSITY SERVICES

### Michigan Tech

Technical management for Department of Applied Computing GPU Cluster 3/2024-present  
Faculty search committee member (Health Informatics) Spring 2024  
Department Charter Committee Spring 2024  
Faculty search committee member (CyberSecurity) Spring 2023  
Graduate Dean's Awards Advisory Committee (reviewed graduate student awards) 11/ 2019-8/2022  
Review Committee for Research Excellence Fund (REF) - Research Seed Grants (RS) October 2019

### USM

**Review Committee for Butch Oustalet Award**, USM Gulf Coast 2019  
**Faculty Affiliate**, USM Center for Undergraduate Research Fall 2015-Summer 2019  
**Graduate Admission Review Committee**, USM School of Computing Fall 2015-Summer 2019  
**Master Program CE Committee**, USM School of Computing Fall 2015-Summer 2019  
**Faculty Search Committee**, USM School of Computing 2016

## Professional Memberships

**IEEE SMC technical committee** 2020-present  
Member, American Heart Association (AHA) 2013-present  
Member, American Society of Nuclear Cardiology (ASNC) 2013-2019

## PROFESSIONAL SERVICES

**IEEE SMC technical committee** April 2020-present  
**Abstract Translation of Featured Papers**, Journal of Nuclear Cardiology 1/2016-8/2023  
**Grant Review**, American Heart Association Data Science 2019  
**Grant Review**, Netherlands Organization for Health Research and Development 10/2016  
**Grant Review**, American Heart Association COVID-19 Data Challenge 7/2020-11/2020  
**Review publications for peer-reviewed journals**, such as Pattern Recognition 2011-present