

XIONGCHAO CHEN

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RESEARCH INTERESTS

Deep learning-enabled medical imaging and imaging analysis techniques for reconstruction, registration, attenuation correction, and denoising of PET/SPECT, CT, and MRI.

EDUCATION

Yale University 2019 - Present
Ph.D. in Biomedical Engineering, Fellowship

Huazhong University of Sci. and Tech. 2015 - 2019
B.S. in Opto-Electronic Engineering (Honored), GPA: 91.36/100, Top 1%

AWARDS AND HONORS

Young Investigator Award, 2022 SNMMI Annual Meeting	2022
Young Investigator Award Finalist, 2021 ASNC Annual Meeting	2021
National Scholarship, PRC (Top 1%)	2017
Outstanding Undergraduates in Terms of Academic Performance (Top 1%)	2017

PUBLICATIONS

- Direct and indirect strategies of deep-learning-based attenuation correction for general purpose and dedicated cardiac SPECT.
Xiongchao Chen, Bo Zhou, Huidong Xie, Luyao Shi, Hui Liu, Wolfgang Holler, MingDe Lin, Yi-Hwa Liu, Edward J Miller, Albert J Sinusas, Chi Liu
European Journal of Nuclear Medicine and Molecular Imaging (IF: 10.057), 2022.
- Cross-vender, cross-tracer, and cross-protocol deep transfer learning for attenuation map generation of cardiac SPECT.
Xiongchao Chen, P Hendrik Pretorius, Bo Zhou, Hui Liu, Karen Johnson, Yi-Hwa Liu, Michael A King, Chi Liu
Journal of Nuclear Cardiology (IF: 5.952), 2022.
- DuDoSS: DeepLearningBased DualDomain sinogram synthesis from Sparsely sampled projections of cardiac SPECT.
Xiongchao Chen, Bo Zhou, Huidong Xie, Tianshun Miao, Hui Liu, Wolfgang Holler, MingDe Lin, Edward J Miller, Richard E Carson, Albert J Sinusas, Chi Liu
Medical Physics (IF: 4.071), 2022.
- Deep-learning-based methods of attenuation correction for SPECT and PET.
Xiongchao Chen, Chi Liu
Journal of Nuclear Cardiology (IF: 5.952), 2022.
- DuDoDR-Net: Dual-domain data consistent recurrent network for simultaneous sparse view and metal artifact reduction in computed tomography.
Bo Zhou, **Xiongchao Chen**, S Kevin Zhou, James S Duncan, Chi Liu
Medical Image Analysis (IF: 13.828), 2022.
- DuDoUFNet: Dual-domain under-to-fully-complete progressive restoration network for simultaneous metal artifact reduction and low-dose CT reconstruction.
Bo Zhou, **Xiongchao Chen**, Huidong Xie, S Kevin Zhou, James S Duncan, Chi Liu
IEEE Transactions on Medical Imaging (IF: 11.037), 2022.

7. Federated Transfer Learning for Low-dose PET Denoising: A Pilot Study with Simulated Heterogeneous Data.
Bo Zhou, Tianshun Miao, Niloufar Mirian, **Xiongchao Chen**, Huidong Xie, Zhicheng Feng, Xueqi Guo, Xiaoxiao Li, S Kevin Zhou, James S Duncan, Chi Liu
IEEE Transactions on Radiation and Plasma Medical Sciences, 2022.
8. Increasing angular sampling through deep learning for stationary cardiac SPECT image reconstruction.
Huidong Xie, Stephanie Thorn, **Xiongchao Chen**, Bo Zhou, Hui Liu, Zhao Liu, Supum Lee, Ge Wang, Yi-Hwa Liu, Albert J Sinusas, Chi Liu
Journal of Nuclear Cardiology (IF: 5.952), 2022.
9. Dual-Domain Cross-Iteration Squeeze-Excitation Network for Sparse Reconstruction of Brain MRI.
Xiongchao Chen, Yoshihisa Shinagawa, Zhigang Peng, Gerardo Hermosillo Valadez
arXiv preprint, 2022.
10. CT-free attenuation correction for dedicated cardiac SPECT using a 3D dual squeeze-and-excitation residual dense network.
Xiongchao Chen, Bo Zhou, Luyao Shi, Hui Liu, Yulei Pang, Rui Wang, Edward J Miller, Albert J Sinusas, Chi Liu
Journal of Nuclear Cardiology (IF: 5.952), 2021.
11. Adaptive super-resolution enabled on-chip contact microscopy.
Hao Zhang*, **Xiongchao Chen***, Tingting Zhu, Chengqiang Yi, Peng Fei
Optics Express (IF: 3.894), 2021.
12. MDPET: A unified motion correction and denoising adversarial network for low-dose gated PET.
Bo Zhou, Yu-Jung Tsai, **Xiongchao Chen**, James S Duncan, Chi Liu
IEEE Transactions on Medical Imaging (IF: 11.037), 2021.
13. Super-resolution generative adversarial network (SRGAN) enabled on-chip contact microscopy.
Hao Zhang, Tingting Zhu, **Xiongchao Chen**, Lanxin Zhu, Di Jin, Peng Fei
Journal of Physics D: Applied Physics (IF: 3.207), 2021.

CONFERENCES

1. Dual-Branch Squeeze-Fusion-Excitation Module for Cross-Modality Registration of Cardiac SPECT and CT.
Xiongchao Chen, Bo Zhou, Huidong Xie, Xueqi Guo, Jiazhen Zhang, Albert J Sinusas, John A Onofrey, Chi Liu
Medical Image Computing and Computer-Assisted Intervention (**MICCAI**) 2022.
2. MCP-Net: Inter-frame Motion Correction with Patlak Regularization for Whole-body Dynamic PET.
Xueqi Guo, Bo Zhou, **Xiongchao Chen**, Chi Liu, Nicha C Dvornek
Medical Image Computing and Computer-Assisted Intervention (**MICCAI**) 2022.
3. DuDoSS: Deep-Learning-Based Dual-Domain Sinogram Synthesis from Sparsely Sampled Projections of Cardiac SPECT. (Oral)
Xiongchao Chen, Bo Zhou, Huidong Xie, Tianshun Miao, Edward J. Miller, Albert J. Sinusas, Chi Liu
Annual Meeting of Society of Nuclear Medicine and Molecular Imaging (**SNMMI**) 2022.
4. Segmentation-free Partial Volume Correction for Cardiac SPECT using Deep Learning.
Huidong Xie, Zhao Liu, Luyao Shi, Kathleen Greco, **Xiongchao Chen**, Bo Zhou, Attila Feher, John Stendahl, Nabil Boutagy, Sinusas Albert, Chi Liu
Annual Meeting of Society of Nuclear Medicine and Molecular Imaging (**SNMMI**) 2022.
5. Investigation of Direct and Indirect Approaches of Deep-Learning-Based Attenuation Correction for General Purpose and Dedicated Cardiac SPECT Scanners. (Oral)

*Equal Contribution

Xiongchao Chen, Bo Zhou, Huidong Xie, Luyao Shi, Hui Liu, Chi Liu

IEEE Nuclear Science Symposium and Medical Imaging Conference (**IEEE NSS/MIC**) 2021.

6. Attenuation Map Generation with Cross-Vendor and Cross-Tracer Transfer Learning for Cardiac SPECT.
Xiongchao Chen, P Hendrik Pretorius, Bo Zhou, Hui Liu, Karen Johnson, Michael A King, Chi Liu
IEEE Nuclear Science Symposium and Medical Imaging Conference (**IEEE NSS/MIC**) 2021.
7. Increasing angular sampling through deep learning for GE Alcyone dedicated cardiac SPECT.
Huidong Xie, Stephanie Thorn, Hui Liu, Zhao Liu, **Xiongchao Chen**, Supum Lee, Ge Wang, Albert Sinusas, Chi Liu
Annual Meeting of Society of Nuclear Medicine and Molecular Imaging (**SNMMI**) 2021.
8. CT-free attenuation correction for dedicated cardiac SPECT using a 3D dual squeeze-and-excitation residual dense network. (Young Investigator Award Session)
Xiongchao Chen, Bo Zhou, Luyao Shi, Hui Liu, Yulei Pang, Rui Wang, Edward J Miller, Albert J Sinusas, Chi Liu
Annual Scientific Session and Exhibition of the American Society of Nuclear Cardiology (**ASNC**) 2021.

UNDER REVIEW

1. DuSFE: Dual-Channel Squeeze-Fusion-Excitation Co-Attention for Cross-Modality Registration of Cardiac SPECT and CT.
Xiongchao Chen*, Bo Zhou*, Huidong Xie, Xueqi Guo, Jiazhen Zhang, James S. Duncan, Edward J. Miller, Albert J. Sinusas, John A. Onofrey, Chi Liu
Under review at **Medical Image Analysis**.
2. MCP-Net: Introducing Patlak Loss Optimization to Whole-body Dynamic PET Inter-frame Motion Correction.
Xueqi Guo, Bo Zhou, **Xiongchao Chen**, Ming-Kai Chen, Chi Liu, Nicha C. Dvornek
Under review at **IEEE Transactions on Medical Imaging**.
3. Segmentation-free Partial Volume Correction for Cardiac SPECT using a Multi-dimensional Dynamic Network.
Huidong Xie, Zhao Liu, Luyao Shi, Kathleen Greco, **Xiongchao Chen**, Bo Zhou, Attila Feher, John C. Stendahl, Nabil Boutagy, Tassos C. Kyriakides, Albert J. Sinusas, Chi Liu
Under review at **IEEE Transactions on Medical Imaging**.
4. Generation of Whole-Body FDG Parametric Ki Images from Static PET Images Using Deep Learning.
Tianshun Miao, Bo Zhou, Juan Liu, Xueqi Guo, **Xiongchao Chen**, Ming-Kai Chen, Jing Wu, Richard E. Carson, Chi Liu
Under review at **IEEE Transactions on Radiation and Plasma Medical Sciences**.
5. $^{99m}\text{Tc}/^{123}\text{I}$ Dual-Isotope Correction for Self-Scatter, Down- Scatter, and Tailing Effect for a CZT SPECT with Varying Tracer Distributions: A Monte Carlo Simulation Study.
Alexandre F. Velo, Peng Fan, Huidong Xie, **Xiongchao Chen**, Michael Ljungberg, and Chi Liu
Under review at **IEEE Transactions on Radiation and Plasma Medical Sciences**.
6. DD-CSENet: Dual-Domain Cross-Iteration Squeeze-Excitation Network for Accelerated Sparse Reconstruction of MRI
Xiongchao Chen, Yoshihisa Shinagawa, Zhigang Peng, Gerardo Hermosillo Valadez
Under review at **IEEE International Symposium on Biomedical Imaging (ISBI) 2023**.

PATENTS

1. CT-free Attenuation Correction for SPECT Using Deep learning.
Chi Liu, **Xiongchao Chen**, Bo Zhou. 2022.

*Equal Contribution

2. A Sub-Micron Lensfree Microscopic Imaging System based on Deep Neural Network.
Peng Fei, Peiyu Liao, **Xiongchao Chen**. 2019
3. A Sub-Pixel Displacement Image Device and its Application.
Peng Fei, Peiyu Liao, **Xiongchao Chen**. 2019

EXPERIENCE

PET Center, Yale University Graduate Research Assistant, Advisors: Prof. Chi Liu	Dec. 2019 - Present
Biomedical Imaging Lab, Yale University Graduate Research Assistant, Advisors: Prof. Joerg Bewersdorf	Jun. 2019 - Dec. 2019
Advanced Manufacturing Lab, Purdue University Undergraduate Research Assistant, Advisors: Prof. Wenzhuo Wu	Jun. 2018 - Nov. 2018
Biophotonics Lab, Huazhong University of Sci. and Tech. Undergraduate Research Assistant, Advisors: Prof. Peng Fei	Sep. 2017 - Jun. 2019

TEACHING

YALE ENAS 510: Physical and Chemical Basis of Bioimaging and Biosensing	2021 Fall
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PROFESSIONAL ACTIVITIES

Conference Review: Medical Image Computing and Computer Assisted Intervention (MICCAI) Educational Challenge '2022
Membership: IEEE, MICCAI, SNMMI, ASNC

SKILLS

Programming	Python, MATLAB, C/C++, \LaTeX .
Imaging Research	Pytorch, OpenCV, ITK-Snap, AMIDE, AMIRA, etc.
Clinical Tools & Protocols	Carimas, WLCQ, etc.

LANGUAGES

Chinese	Native or bilingual proficiency.
English	Full professional proficiency.