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 Sept. 2019 - Jan. 2024 (Expected)
Ph.D. in Biomedical Engineering, Fellowship

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

EXPERIENCE

Siemens HealthCare, Knoxville, TN Jun. 2023 - Sept. 2023
PET Physics Group Internship, Advisors: Dr. Deepak Bharkhada

Siemens Medical Solutions, Malvern, PA Jun. 2022 - Sept. 2022
Image Analytics Internship, Advisors: Dr. Gerardo Hermosillo Valadez

GE HealthCare, Israel Aug. 2021 - Present
Technical Specialist, part-time, remote

PET Center, Yale University, New Haven, CT Dec. 2019 - Present
Graduate Research Assistant, Advisors: Prof. Chi Liu

Biomedical Imaging Lab, Yale University, New Haven, CT Jun. 2019 - Dec. 2019
Graduate Research Assistant, Advisors: Prof. Joerg Bewersdorf

Advanced Manufacturing Lab, Purdue University, West Lafayette, IN Jun. 2018 - Nov. 2018
Undergraduate Research Assistant, Advisors: Prof. Wenzhuo Wu

Biophotonics Lab, Huazhong University of Sci. and Tech., China Sept. 2017 - Jun. 2019
Undergraduate Research Assistant, Advisors: Prof. Peng Fei

AWARDS AND HONORS

Young Investigator Award, Connecticut Area Medical Physics Society 2023
Young Investigator Award, SNMMI Annual Meeting 2022
Student Travel Award, MICCAI Society 2022
Young Investigator Award Finalist, 2021 ASNC Annual Meeting 2021
Honored Undergraduate Student Awards, PRC (Top 1%) 2017
National Scholarship, PRC (Top 1%) 2017
Outstanding Undergraduates in Terms of Academic Performance (Top 1%) 2017
The 1^{st} Prize of the National Mathematics Competition, PRC 2016

PUBLICATIONS

1. DuSFE: Dual-Channel 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 Analysis (IF: 13.828), 2023.

2. 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.

3. 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.

4. 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.

5. Deep-learning-based methods of attenuation correction for SPECT and PET.
Xiongchao Chen, Chi Liu.
Journal of Nuclear Cardiology (IF: 5.952), 2022.

6. 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.

7. 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.

8. 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.

9. 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.

10. 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.
IEEE Transactions on Radiation and Plasma Medical Sciences.

11. 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.

12. Segmentation-free PVC for Cardiac SPECT using a Densely-connected 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, Ge Wang, Albert J Sinusas, Chi Liu.
IEEE Transactions on Medical Imaging (IF: 11.037), 2022.

13. 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.

14. Adaptive super-resolution enabled on-chip contact microscopy.
Hao Zhang*, **Xiongchao Chen***, Tingting Zhu, Chengqiang Yi, Peng Fei.
Optics Express (IF: 3.894), 2021.

15. 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.

16. 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. DD-CISENet: Dual-Domain Cross-Iteration Squeeze and Excitation Network for Accelerated MRI Reconstruction.
Xiongchao Chen, Zhigang Peng, Gerardo Hermosillo Valadez.
Medical Imaging with Deep Learning **(MIDL)** 2023.

2. 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.

3. Fast-MC-PET: A Novel Deep Learning-aided Motion Correction and Reconstruction Framework for Accelerated PET.
Bo Zhou, Yu-Jung Tsai, Jiazhen Zhang, Xueqi Guo, Huidong Xie, **Xiongchao Chen**, Tianshun Miao, Yihuan Lu, James S Duncan, Chi Liu.
Information Processing in Medical Imaging **(IPMI)** 2023.

4. 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.

5. 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.

6. 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.

7. ^{99m}Tc/^{123}I Dual-Isotope Scatter and Crosstalk Correction for a CZT SPECT with Varying Tracer Distributions: A Monte Carlo Simulation Study
Alexandre Velo, Peng Fan, Huidong Xie, **Xiongchao Chen**, Michael Ljungberg, Chi Liu.
Annual Meeting of Society of Nuclear Medicine and Molecular Imaging **(SNMMI)** 2022.

8. Deep learning based direct reconstruction with attenuation and scatter corrections for SPECT
Hui Liu, Jing Wu, Yajing Zhang, **Xiongchao Chen**, Lilei Gao, Li Cheng, Yaqiang Liu.

*Equal Contribution

Annual Meeting of Society of Nuclear Medicine and Molecular Imaging **(SNMMI)** 2022.

9. Investigation of Direct and Indirect Approaches of Deep-Learning-Based Attenuation Correction for General Purpose and Dedicated Cardiac SPECT Scanners. (Oral)
   Xiongchao Chen, Bo Zhou, Huidong Xie, Luyao Shi, Hui Liu, Chi Liu.
   IEEE Nuclear Science Symposium and Medical Imaging Conference **(IEEE NSS/MIC)** 2021.

10. 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.

11. 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.

12. 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. Joint Denoising and Few-angle Reconstruction for Low-dose Cardiac SPECT Using a Dual-domain Iterative Network with Adaptive Data Consistency.
   Xiongchao Chen, Bo Zhou, Huidong Xie, Xueqi Guo, Qiong Liu, Albert J. Sinusas, Chi Liu.
   Under review at **MICCAI (2023)**.

2. Cross-domain Iterative Network for Simultaneous Denoising, Limited-angle Reconstruction, and Attenuation Correction of Low-dose Cardiac SPECT.
   Xiongchao Chen, Bo Zhou, Huidong Xie, Xueqi Guo, Qiong Liu, Albert J. Sinusas, Chi Liu.
   Under review at **MICCAI (2023)**.

3. Transformer-based Dual-domain Network for Few-view Dedicated Cardiac SPECT Image Reconstructions.
   Huidong Xie, Bo Zhou, **Xiongchao Chen**, Xueqi Guo, Stephanie Thorn, Yi-Hwa Liu, Ge Wang, Albert J. Sinusas, Chi Liu.
   Under review at **MICCAI (2023)**.

4. TAI-GAN: Temporally and Anatomically Informed GAN for early-to-late frame conversion in dynamic cardiac PET motion correction.
   Xueqi Guo, Luyao Shi, **Xiongchao Chen**, Bo Zhou, Qiong Liu, Huidong Xie, Yi-Hwa Liu, Richard Palyo, Adam Liu, Edward J. Miller, Albert J. Sinusas, Bruce Spottiswoode, Chi Liu, Nicha Dvornek.
   Under review at **MICCAI (2023)**.

5. 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**.

6. ^{99m}Tc/^{123}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**.

PATENTS

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

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.
4. A Vision-Based Intelligent Tennis Robot.
   Junfeng Wu, Yanyu Peng, Zhuang Wang, Qi Yang, Wuyi Zhang, **Xiongchao Chen**. 2018.
5. A Circular and Quasi-Circular Visual Inspection Method and System.
   Qi Yang, Junfeng Wu, **Xiongchao Chen**, Qiansong Deng. 2018.
6. A Narrowband Optical Notch Filter.
   Changjian Ke, Yibo Zhong, **Xiongchao Chen**. 2017.

TEACHING

YALE ENAS 510: Physical and Chemical Basis of Bioimaging and Biosensing (TA) 2021 Fall

PROFESSIONAL ACTIVITIES

Journal Review:
European Journal of Nuclear Medicine and Molecular Imaging (EJNMMI) Physics
European Journal of Nuclear Medicine and Molecular Imaging (EJNMMI) Research
Frontiers in Medicine

Conference Review:
Medical Image Computing and Computer Assisted Intervention (MICCAI) '2023
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.