Zhaoheng Xie (谢肇恒)



Assistant Professor (Tenure-track)

Institute of Medical Technology, Peking University Health Science Center, Peking University

National Biomedical Imaging Center (Courtesy Appointment), College of Future Technology, Peking University

Email: xiezhaoheng@pku.edu.cn Phone: +86-01082805819

Address: 38 Xueyuan Rd, Haidian District, Beijing, China

ORCID: 0000-0001-8003-8778 Lab website: xiezhaoheng.github.io

EDUCATION & ACADEMIC TRAINING

2022.07 – Present	**Assistant Professor (Tenure-track)**, Peking University
2018.02 – 2022.06	**Postdoctoral Scholar**, Department of Biomedical Engineering, University of California, Davis, USA
2012.09 – 2017.12	**Ph.D. in Biomedical Engineering**, Peking University, Beijing, China
2008.09 – 2012.07	**B.E. in Electrical Engineering**, Xi'an Jiaotong University, Xi'an, China

RESEARCH INTERESTS

Nuclear medicine and molecular imaging; imaging physics and reconstruction algorithms; quantitative pharmacokinetic modeling and parametric imaging; dosimetry of radiopharmaceuticals and optimization of integrated theranostic strategies; artificial intelligence for science (AI4S).

RESEARCH HIGHLIGHTS

Our laboratory focuses on: medical imaging physics and reconstruction algorithms, quantitative pharmacokinetic modeling and parametric imaging, dosimetry of radiopharmaceuticals and optimization of integrated theranostic strategies, and AI-driven design of radionuclide probes, multimodal image analysis and clinical decision-making. Over the past decade, as a key contributing researcher, I have participated in a series of major research projects, including a small-animal quad-modality molecular imaging system, the world's first total-body PET system (EXPLORER), the brain PET system dedicated to the U.S. BRAIN Initiative (NeuroEXPLORER), and the world's first total-body full-field high-resolution TOF-DOI PET/CT system. He has published 40+ papers in high-impact SCI journals (Nat. Commun., IEEE TMI, MedIA, EJNMMI, etc.) and 10+ papers at top conferences (ICML, CVPR, SNMMI, EANM, IEEE NSS/MIC, Fully 3D), and holds 10+ patents (3 U.S.). He has received several international awards, including the SNMMI Young Investigator Award (1st place), the SNMMI Henry N. Wagner Best Paper Award, EANM Top-Rated Oral, and ICML Spotlight; Our team was a top-performing team in AutoPET. Some works have been featured and reported by Science (AAAS), Nature News, and NIH. My supervised students have received 1 NSFC Youth Student Basic Research Project (Ph.D.) and 2 Beijing Natural Science Foundation Undergraduate "Qiyan" projects; two students were named "Beijing Outstanding Graduates" and 1 received the Peking University Outstanding Dissertation Award, etc.

JOURNAL PUBLICATIONS

† Equal contribution; * Corresponding author. The name of Zhaoheng Xie is in bold.

1. CHEN Y†, ZHOU C†, GUO L†, DUAN H, LI F, YANG L, DUAN Y, LI H, XU R, CHENG Z*, **XIE Z***. Whole-body [18F]FDG PET/CT characterizes multi-organ metabolic alterations in MASLD[J]. European Journal of Nuclear Medicine and Molecular Imaging, 2026. (Accepted)
2. WANG Y†, YANG S†, WANG Z, WANG Z, HUANG X*, **XIE Z***. Meta-learning-based robust timing estimation across varying TOF-PET detector configurations[J]. IEEE Transactions on Instrumentation and Measurement, 2026. DOI: 10.1109/TIM.2026.3738187.

3. WANG Z, JIN X, ZHAO X, DONG Z, LIU W, PENG Q, REN Q*, **XIE Z***. Multi-GPU parallel framework for DOI-enabled long axial field-of-view PET image reconstruction[J]. Physics in Medicine & Biology, 2026. DOI: 10.1088/1361-6560/aeabe8.

4. DONG Z, JIN X, MENG X, LIU W, LI N, YANG Z, YU J*, **XIE Z***. Learning-enhanced hybrid planar-SPECT dosimetry for voxel-level Monte Carlo dose estimation in radionuclide therapy[J]. Physics in Medicine & Biology, 2026. DOI: 10.1088/1361-6560/aea39b.

5. MA K†, CHENG F†, LIU W, SHAO W, YANG Y, LI N, MENG X*, **XIE Z***. Enhancing uncertainty assessment in dynamic PET imaging with residual permutation and clustering[J]. Medical Image Analysis, 2026, 110: 103997. DOI: 10.1016/j.media.2026.103997.

6. SHAO W, CHEN Y, FU O, LI T, YANG Z, LI N, HAN H, MENG X*, **XIE Z***. Neural network approximation aided kinetic parameter inference of compartment models in dynamic PET[J]. IEEE Transactions on Radiation and Plasma Medical Sciences, 2026. DOI: 10.1109/TRPMS.2026.3660465.

7. ZHAO N, WANG Y, YANG S, GUO W, LI Z, CAO H, ZHANG Z, LI Y, CHEN D, XIA S, **XIE Z**, QU Y, WU Y, LI J, YI L, WANG G, GUO M. Surgical Protocols for Deep Cervical Lymphovenous Anastomosis in a Rat Model: Lymph Node and Lymphatic Vessel Anastomoses[J]. Journal of Visualized Experiments, 2025, 225: e69201. DOI: 10.3791/69201.

8. SHAO W†, ZHANG Y†, DU F, CHENG F, CHEN Y, MENG X, LIANG Y*, **XIE Z***. Neural network-aided unsupervised input function estimation for dual-time-window PET Patlak analysis[J]. EJNMMI Physics, 2025.

9. CHEN Y†, GAO L†, GAO Y, WANG R, LIAN J, MENG X, DUAN Y, CHAI L, HAN H, CHENG Z*, **XIE Z***. Modality-projection universal model for comprehensive full-body medical imaging segmentation[J]. Nature Communications, 2025, 16(1): 9423.

10. WANG Y†, GAO T†, SU S†, WANG T, ZHANG S, GAO Y, **XIE Z***, HAN H*. Imaging Brain Interstitial Fluid[J]. Sensing and Imaging, 2025, 26(1): 1-13.

11. LIU W, XI P, LIU J, XU X, **XIE Z**, LU Y, MENG X, REN Q. Design and Performance Assessment of a High-Resolution Small-Animal PET System[J]. Bioengineering, 2025, 12(10): 1119.

12. ZHU Y, LI S, **XIE Z**, LEUNG E, BAYERLEIN R, OMIDVARI N, ABDELHAFEZ Y, CHERRY S, QI J, BADAWI R, WANG G*. Feasibility of PET-enabled dual-energy CT imaging: First physical phantom and initial patient study results[J]. European journal of nuclear medicine and molecular imaging, 2025, 52(5): 1912-1923.

13. YANG L, GAO Y, LOPES L, LIAN J, FU W, TAN H, YANG S, **XIE Z**, HUANG Y, ZHANG J, LU Y, TANG H, XIONG B, WEI X, XIE L, PENG Y, LIU X, HAN H*. Accelerated Molecular Transportation in the Brain Extracellular Space with 755-nm Light Attenuates Post-Stroke Cognitive Impairment in Rats[J]. Cyborg and Bionic Systems, 2025, 6: 0262. DOI: 10.34133/cbsystems.0262.

14. ZHAO G, CHEN H, YAN J, TONG Z, FU Y, **XIE Z**, HAN H*. Efficacy of citicoline delivered via brain extracellular space against experimental acute ischemic stroke in rats[J]. International Journal of Medical Sciences, 2024, 21(7): 1274.

15. ZHENG D, HUANG Y, LI C, LU Y, **XIE Z**, LIANG Y, REN Q, MENG X*. Novel Radiofluorinated Nanobody PET Tracer for Preclinical Studies of TIM3 Expression[J]. Molecular Pharmaceutics, 2025, 22(10): 6141-6150.

16. DENG Z, XI P, ZHENG D, **XIE Z**, REN Q*, MENG X*. The Impact of PET Imaging on Translational Medicine: Insights from Large-Animal Disease Models[J]. Biomolecules, 2025, 15(7): 919. DOI: 10.3390/biom15070919.

17. ZHENG D, HUANG Y, LI C, LU Y, **XIE Z**, REN Q, LIANG Y, MENG X*. A Radiofluorinated Nanobody PET Tracer to Dynamically Visualize Differential Nectin4 Expression In Vivo[J]. Journal of Medicinal Chemistry, 2025, 68(20): 21366-21376.

18. CHEN Y, WANG Y, **XIE Z***. VP-SFDA: Visual Prompt Source-Free Domain Adaptation for Cross-Modal Medical Image[J]. Health Data Science, 2025, 5: 0143. DOI: 10.34133/hds.0143.

19. ZHANG S, SHANG K, GONG L, XIE Q, SUN J, XU M, WEI X, **XIE Z**, LIU X, TANG H, XU Z, WANG W, XIAO H, LIN Z, HAN H*. Smart Organic–Inorganic Copolymer Nanoparticles Distinguish Between Microglia and Cancer Cells for Synergistic Immunotherapy in Glioma[J]. Advanced Science, 2025, 12(25): 2500882. DOI: 10.1002/advs.202500882.

20. ZHANG X, CHEN Q, HE H, ZHU L, **XIE Z**, LU Y, CHENG F. Generative learning-based lightweight MRI brain tumor segmentation with missing modalities[J]. Expert Systems with Applications, 2025, 261: 125478.

21. WANG Q, ZHANG S, ZENG D, **XIE Z**, GUO H, ZENG T, FAN F*. Don't fear peculiar activation functions: EUAF and beyond[J]. Neural Networks, 2025, 186: 107258.

22. YANG C, XIE J, HUANG X, TAN H, LI Q, TANG Z, MA X, LU J, HE Q, FU W, HUANG Y, YAN J, LI H, **XIE Z**, SUI Y, LU Y, HAN H*. ECS-Net: Extracellular space segmentation with contrastive and shape-aware loss by using cryo-electron microscopy imaging[J]. Expert Systems with Applications, 2025, 270: 126370. DOI: 10.1016/j.eswa.2024.126370.

23. ZOU J, GAO T, WANG Y, REN M, LIU D, LONG R, CHENG Y, LIU M, XU Z, **XIE Z**, LV P, YUAN L, HAN H. Dynamic distribution and clearance of 99mTc-DTPA in brain extracellular space[J]. Journal of Peking University (Health Sciences), 2025, 57(3): 562-568. DOI: 10.19723/j.issn.1671-167X.2025.03.021.

24. TIAN Z, ZUO Y, XI P, MENG X, SHAO W, YANG Y, REN Q, YU J*, **XIE Z***. A novel relative-equilibrium graphical plot for rapid reversible tracer studies in dynamic PET imaging[J]. Physics in Medicine & Biology, 2024, 69(16): 165005.

25. CHEN Y, GAO Y, ZHU L, SHAO W, LU Y, HAN H, **XIE Z***. PCNet: Prior category network for CT universal segmentation model[J]. IEEE Transactions on Medical Imaging, 2024, 43(9): 3319-3330.

26. CHEN Y, GAO Y, ZHU L, LI J, WANG Y, HU J, HAN H, LU Y, **XIE Z***. Structure-Enhanced Unsupervised Domain Adaptation for CT Whole-Brain Segmentation[J]. IEEE Transactions on Radiation and Plasma Medical Sciences, 2024, 8(8): 926-938.

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28. LIAN J, YANG L, TAN H, SU S, SERRANO LOPES L, CHENG F, YAN J, FU Y, FU W, **XIE Z**, HAN H*. A novel neuroprotective method against ischemic stroke by accelerating the drainage of brain interstitial fluid[J]. Science China Life Sciences, 2024, 67(10): 2213-2223.

29. LI H, GAO M, SONG H, WU X, LI G, CUI Y, LI Y, **XIE Z**, REN Q, ZHANG H*. Predicting ischemic stroke risk from atrial fibrillation based on multi-spectral fundus images using deep learning[J]. Frontiers in Cardiovascular Medicine, 2023, 10: 1185890. DOI: 10.3389/fcvm.2023.1185890.

30. LI T, **XIE Z**, QI W, ASMA E, QI J*. Unsupervised deep learning framework for data-driven gating in positron emission tomography[J]. Medical Physics, 2023, 50(10): 6047-6059. DOI: 10.1002/mp.16642.

31. LEUNG E, ABDELHAFEZ Y, BERG E, **XIE Z**, ZHANG X, BAYERLEIN R, SPENCER B, LI E, OMIDVARI N, SELFRIDGE A*. Relating 18F-FDG image signal-to-noise ratio to time-of-flight noise-equivalent count rate in total-body PET[J]. Physics in Medicine & Biology, 2022, 67(12): 125007.

32. KANG Y, ZHAI X, LU S, VULETIC I, WANG L, ZHOU K, PENG Z, REN Q*, **XIE Z***. A hybrid imaging platform (CT/PET/FMI) for evaluating tumor necrosis and apoptosis in real-time[J]. Frontiers in Oncology, 2022, 12: 772392.

33. **XIE Z**, LI T, ZHANG X, QI W, ASMA E, QI J*. Anatomically aided PET image reconstruction using deep neural networks[J]. Medical Physics, 2021, 48(9): 5244-5258. DOI: 10.1002/mp.15051.

34. LAI Y, WANG Q, ZHOU S, **XIE Z**, QI J, CHERRY S, JIN M, CHI Y, DU J*. H2RSPET: a 0.5 mm resolution high-sensitivity small-animal PET scanner, a simulation study[J]. Physics in Medicine & Biology, 2021, 66(6): 065016.

35. **XIE Z**, BAIKEJIANG R, LI T, ZHANG X, GONG K, ZHANG M, QI W, ASMA E, QI J*. Generative adversarial network based regularized image reconstruction for PET[J]. Physics in Medicine & Biology, 2020, 65(12): 125016.

36. YANG K, ZHAI X, **XIE Z**, ZHOU K, MENG X, REN Q, LU Y*. A practical calibration criterion for image-based material decomposition in spectral computed tomography[J]. Alexandria Engineering Journal, 2020, 59(3): 1371-1379.

37. ZHANG X, CHERRY S, **XIE Z**, SHI H, BADAWI R, QI J*. Subsecond total-body imaging using ultrasensitive positron emission tomography[J]. Proceedings of the National Academy of Sciences, 2020, 117(5): 2265-2267. DOI: 10.1073/pnas.1917379117.

38. ZHANG X, **XIE Z**, BERG E, JUDENHOFER M, LIU W, XU T, DING Y, LV Y, DONG Y, DENG Z, TANG S, SHI H, HU P, CHEN S, BAO J, LI H, ZHOU J, WANG G, CHERRY S, BADAWI R, QI J*. Total-Body Dynamic Reconstruction and Parametric Imaging on the uEXPLORER[J]. Journal of Nuclear Medicine, 2020, 61(2): 285-291. DOI: 10.2967/jnumed.119.230565.

39. **XIE Z**†, LI S†, ZHOU K, VULETIC I, MENG X, ZHU S, XU H, YANG K, XU B, ZHANG J, REN Q*. PKU-PET-II: a novel SiPM-based PET imaging system for small animals[J]. Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment, 2018, 877: 104-111.

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41. LI S†, **XIE Z**†, HUANG Z, YANG K, XU B, REN Q*. Off-axis imaging in keel-edge pinhole single photon emission computed tomography system based on Monte Carlo simulation[J]. Chinese Physics Letters, 2016, 33(4): 048701. DOI: 10.1088/0256-307X/33/4/048701.

42. **XIE Z**†, LI S†, YANG K, XU B, REN Q*. Evaluation of a wobbling method applied to correcting defective pixels of CZT detectors in SPECT imaging[J]. Sensors, 2016, 16(6): 772.

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44. 周坤, 孟祥溪, **谢肇恒**, 李素莹, 田涧, 杨昆, 任秋实 *. 一种新型的小动物四模态分子医学影像系统 [J]. 中国医疗设备, 2015, 30(2): 7-10. DOI: 10.3969/j.issn.1674-1633.2015.02.002.

45. 张秋实, 卢闫晔, **谢肇恒**, 杨昆, 任秋实 *. 用于医学成像的碲锌镉单极型探测器研究进展 [J]. 半导体光电, 2013, 34(2): 171-179.

BOOK CHAPTER

1. TIAN Z, **XIE Z**. Toward a new frontier in PET image reconstruction: a paradigm shift to the learning-based methods[M]//Gamma Ray Imaging: Technology and Applications. Springer, Cham, 2023: 21-42. DOI: 10.1007/978-3-031-30666-2_2.

CONFERENCE PAPERS & MEETING ABSTRACTS

1. XU H, CHEN Y, FU W, HAN H, **XIE Z***. NeuronCtrl: geometry-aware safe closed-loop generative control for neuronal microenvironment dynamics[C]//Proceedings of the 43rd International Conference on Machine Learning (ICML 2026), PMLR. 2026. (Spotlight, 2.2% of 23,918 submissions)

2. ZHAO X, ZHAO W, **XIE Z***. A software-based coincidence sorter for simultaneous PET emission and Lu-176 intrinsic transmission data extraction[C]//IEEE Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC). 2026. (Oral)
3. XU R, DUAN Y, GAO L, CHEN Y, CHENG Z, **XIE Z***. Multiorgan metabolic dysregulation in Alzheimer's disease: total-body PET/CT reveals systemic network interactions with amyloid burden[C]//European Association of Nuclear Medicine (EANM) Annual Congress. 2025. (Oral)
4. ZHAO W, ZHAO X, DONG Z, REN Q, **XIE Z***. Load balancing for multi-GPU total-body PET image reconstruction[C]//The 17th International Meeting on Fully Three-Dimensional Image Reconstruction in Radiology and Nuclear Medicine (Fully 3D). 2025. (Oral)
5. CHEN Y, MENG X, WANG Y, ZENG S, LIU X, **XIE Z***. LUCIDA: low-dose universal-tissue CT image domain adaptation for medical segmentation[C]//Medical Image Computing and Computer Assisted Intervention (MICCAI). 2024: 393-402.
6. TIAN Z, YU J, XI P, MENG X, SHAO W, YANG Z, LI N, REN Q, ZUO Y, **XIE Z***. Streamlining Dynamic PET Imaging for Reversibly Binding Tracers: The Relative-Equilibrium Graphical Plot Without Early-Time Input Requirements[C]//Journal of Nuclear Medicine (SNMMI Annual Meeting Abstracts). 2024, 65(suppl 2): 241269.
7. MA K, SHAO W, TIAN Z, LI N, MENG X, **XIE Z***. Advancing Uncertainty Evaluation in Dynamic PET Imaging Through Residual Permutation and Clustering Techniques[C]//Journal of Nuclear Medicine (SNMMI Annual Meeting Abstracts). 2024, 65(suppl 2): 242123.
8. YANG Y, MENG X, TIAN Z, **XIE Z***, YANG Z. Kinetic Parameter Estimations Using A Novel Probabilistic Graphical Model Given Dynamic PET Data[C]//Journal of Nuclear Medicine (SNMMI Annual Meeting Abstracts). 2024, 65(suppl 2): 242463.
9. SHAO W, TIAN Z, LI N, MENG X, **XIE Z***. Advanced Delay Correction Using TAC Integration and Newton-Raphson Method in Dynamic PET Imaging[C]//Journal of Nuclear Medicine (SNMMI Annual Meeting Abstracts). 2024, 65(suppl 2): 242448.
10. CARSON R, TOYONAGA T, BADAWI R, CHERRY S, DU J, FONTAINE K, GALLEZOT J, GRAVEL P, HE L, HILLMER A, HOLDERMAN N, HONHAR P, JOCELYN H, HU L, JONES T, KHATTAR N, LEUNG E, LI T, LI Y, LIU C, LIU P, LU Z, MAJEWSKI S, MATUSKEY D, MORRIS E, MULNIX T, RAVAL N, SAMANTA S, SELFRIDGE A, SHANINA E, SUN X, VOLPI T, **XIE Z***, XU T, ZENG T, ZHANG J, ZHANG X, FRANCO A, MASDEU J, FUJITA M, QI J, LI H. Exceptional PET Images from the First Human Scan on the NeuroEXPLORER, a next-generation ultra-high performance brain PET imager[C]//Journal of Nuclear Medicine (SNMMI Annual Meeting Abstracts). 2023, 64(suppl 1): P298.
11. SHAO W, CHEN Y, LI N, YANG Z, MENG X, **XIE Z***. Fast and robust estimation of kinetic parameters in dynamic PET imaging using neural network-based discretization method[C]//Journal of Nuclear Medicine (SNMMI Annual Meeting Abstracts). 2023, 64(suppl 1): P863.
12. ZHU Y, SPENCER B, **XIE Z***, LEUNG E, BAYERLEIN R, OMIDVARI N, CHERRY S, QI J, BADAWI R, WANG G. Super-resolution reconstruction of γ-ray CT images for PET-enabled dual-energy CT imaging[C]//Proceedings of SPIE Medical Imaging. 2023: 12463.
13. HUANG B, LI T, ZHANG X, **XIE Z**, QI J*. SPLIT: Statistical Positronium Lifetime Image reconstruction via events sorting by Thresholds[C]//Journal of Nuclear Medicine (SNMMI Annual Meeting Abstracts). 2022, 63(suppl 2): 2514.
14. ZHANG X, **XIE Z***, CHENG Z, DUAN Y, XU T, LI C, LI H, JONES T, CHERRY S, BADAWI R, QI J. Real-time Motion Tracking for Total-body Molecular Imaging[C]//Journal of Nuclear Medicine (SNMMI Annual Meeting Abstracts). 2022, 63(suppl 2): 2601.

15. LI T, **XIE Z***, QI W, ASMA E, QI J. Unsupervised PET Image Denoising using Double Over-parameterization[C]//Journal of Nuclear Medicine (SNMMI Annual Meeting Abstracts). 2022, 63(suppl 2): 3239.
16. LI T, ZHANG X, **XIE Z***, SHI H, CHERRY S, BADAWI R, QI J. Total-Body Parametric Reconstruction with Deep Learning-based Data-driven Motion Compensation[C]//Journal of Nuclear Medicine (SNMMI Annual Meeting Abstracts). 2021, 62(suppl 1): 60.
17. LEUNG E, REVILLA E, SPENCER B, **XIE Z***, ZHANG X, OMIDVARI N, BADAWI R, CHERRY S, LU Y, BERG E. A quantitative image reconstruction platform with integrated motion detection for total-body PET[C]//Journal of Nuclear Medicine (SNMMI Annual Meeting Abstracts). 2021, 62(suppl 1): 1549.
18. ZHANG X, **XIE Z**, ZUO Y, SHI H, WANG G, CHERRY S, BADAWI R, QI J*. 4D Total-Body PET Parametric Imaging with Cardiac Modulation[C]//Journal of Nuclear Medicine (SNMMI Annual Meeting Abstracts). 2021, 62(suppl 1): 54.
19. **XIE Z**, QI J*. Image domain deep scatter estimation for high-temporal resolution dynamic PET[C]//IEEE Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC). 2020.
20. ZHANG X, **XIE Z**, WANG G, SCHMALL J, SHI H, CHERRY S, BADAWI R, QI J*. Comparison of Linear and Non-linear Total-Body PET Parametric Imaging[C]//Journal of Nuclear Medicine (SNMMI Annual Meeting Abstracts). 2020, 61(suppl 1): 206.
21. **XIE Z**, QI J*. Anatomy-guided PET image reconstruction with deep neural network[C]//Journal of Nuclear Medicine (SNMMI Annual Meeting Abstracts). 2020, 61(suppl 1): 8.
22. ZHANG X, **XIE Z**, BERG E, JUDENHOFER M, LIU W, LV Y, DING Y, LV X, XU T, DONG Y, SHI H, CHEN S, HU P, BAO J, LI H, CHERRY S, BADAWI R, QI J*. Total-Body Parametric Imaging using Kernel and Direct Reconstruction on the uEXPLORER[C]//Journal of Nuclear Medicine (SNMMI Annual Meeting Abstracts). 2019, 60(suppl 1): 456.
23. **XIE Z**, QI J*. Deep learning based PET image reconstruction protocol for inter-vendor scanners[C]//IEEE Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC). 2019.
24. **XIE Z**, BAIKEJIANG R, GONG K, QI J*. Generative adversarial networks based regularized image reconstruction for PET[C]//Proceedings of SPIE 11072, The 15th International Meeting on Fully Three-Dimensional Image Reconstruction (Fully 3D). 2019.
25. **XIE Z**, ZHOU K, LU Y, YANG K, REN Q*. A novel reconstruction algorithm for positron emission tomography based on 3-D data rebinning[C]//The 14th International Meeting on Fully Three-Dimensional Image Reconstruction (Fully 3D). 2017.
26. **XIE Z**, ZHOU K, LI S, YANG K, REN Q*. An integrated quad-modality molecular imaging system for small animals[C]//World Molecular Imaging Congress (WMIC). 2014.

PATENTS

1. JIAO Wenpei, **XIE Zhaoheng**, CHEN Yixin. Method and system for metabolic analysis of a living organism: CN Appl. No. 202510554692.2[P]. 2025.
2. WANG Zhao, **XIE Zhaoheng**, REN Qiushi, LIU Wei. PET image reconstruction method based on LOR encoding and load balancing: CN 117648195 A[P]. 2024. (Appl. No. 202410115901.9)
3. QI Jinyi, LI Tiantian, **XIE Zhaoheng**, QI Wenyuan, YANG Li, CHAN Chung, ASMA Evren. Scatter estimation for PET from image-based convolutional neural network: US 12475613 B2[P]. 2025-11-18.
4. QI Jinyi, LI Tiantian, **XIE Zhaoheng**, QI Wenyuan, YANG Li, CHAN Chung, ASMA Evren. Using neural networks to estimate motion vectors for motion corrected PET image reconstruction: US 2021/0304457 A1 (Appl. No. 17/180,182)[P]. 2021.

5. ZHAI Xiaohui, **XIE Zhaoheng**, YU Zhen, ZHOU Kun, TIAN Jian, LI Suying. PET-fluorescence bimodal intraoperative navigation imaging system and imaging method thereof: CN 106420057 B[P]. (Appl. No. 201621267932.3)
6. LI Changhui, ZHAI Xiaohui, WANG Guangzhi, XING Feng, **XIE Zhaoheng**, REN Qiushi, YANG Xin, FANG Hui. Photoacoustic imaging device based on graphene and imaging method thereof: CN 201610268620.2 (Appl. Pub. No. CN105905517A)[P]. 2016.
7. REN Qiushi, LI Suying, YANG Kun, **XIE Zhaoheng**. Geometric calibration phantom for a pinhole SPECT system and calibration method thereof: CN 106037782 A[P]. 2016. (Appl. No. 201610494693.3)
8. REN Qiushi, **XIE Zhaoheng**, LI Suying, LIU Qi, LIU Xi, ZHANG Qiushi, LU Yanye, ZHOU Kun, TIAN Jian. A SPECT imaging method based on ordered-subset algorithm: CN 201410285926.X (Appl. Pub. No. CN104027129A)[P]. 2014.
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10. REN Qiushi, YANG Kun, LI Suying, **XIE Zhaoheng**, ZHANG Qian, LIU Qian, LIU Xin, HUANG Yi, ZHOU Kun, LU Yanye, TIAN Jian. A humanized alarm and control method for sleep-monitoring: CN 201410009451.1 (Appl. Pub. No. CN103750842A)[P]. 2014.
11. REN Qiushi, YANG Kun, **XIE Zhaoheng**, LI Suying, ZHANG Qiushi, LIU Qi, LU Yanye, ZHOU Kun, TIAN Jian, HUANG Yixing, LIU Xi, YU Yue. A testing device and method for pinhole SPECT collimator: CN 201310716669.6 (Appl. Pub. No. CN203619577U)[P]. 2014.

GRANTS & FUNDING

As Principal Investigator (Assistant Professor, Peking University)

1. **Key technologies for structural information acquisition and imaging of the brain extracellular space** (2024.01 – 2028.12). NSFC Major Program — Sub-project. *Leading Investigator.*
2. **Whole-body PET image reconstruction and quantitative analysis** (2023.01 – 2025.12). NSFC Excellent Young Scientists Fund (Overseas). *Leading Investigator.*
3. **Digital diagnosis and treatment & advanced manufacturing** (2023.01 – 2024.12). Beijing Advanced Discipline Construction Program — Sub-project. *Leading Investigator.*
4. **Intelligent analysis and applications of molecular medical imaging** (2023.01 – 2023.12). Peking University Talent Introduction Program. *Leading Investigator.*
5. **Course development of imaging principles and instrumentation integrated with GPT models** (2024.01 – 2024.12). Peking University Undergraduate Teaching Reform Program. *Leading Investigator.*
6. **AI-based diagnosis, staging and subtyping of Alzheimer's disease from multimodal images** (2024.10 – 2025.10). Beijing Natural Science Foundation Undergraduate "Qiyan" Program. *Supervisor.*
7. **Quantitative analysis of drug-induced sleep endoscopy images based on spatial intelligence and dynamic features** (2025.07 – 2026.07). Beijing Natural Science Foundation Undergraduate "Qiyan" Program. *Supervisor.*
8. **Multi-organ metabolic information extraction and analysis based on total-body PET/CT** (2026.01 – 2027.12). NSFC Youth Student Basic Research Project (Ph.D. track). *Supervisor.*

As Postdoctoral Scholar

1. **Medical image reconstruction based on artificial intelligence and machine learning** (02/2018 – 05/2022). Leading Investigators: Prof. Jinyi Qi, UC Davis. NIH Exploratory/Developmental Grant (R21 EB026668).
2. **Physics correction and dynamic imaging analysis for the total-body molecular imaging system** (03/2019 – 07/2022). Leading Investigators: Prof. Simon Cherry & Ramsey Badawi, UC Davis. NIH Transformative Research Award (R01 CA206187).
3. **System optimization and image reconstruction algorithms for high-resolution brain PET** (08/2021 – 07/2022). Leading Investigators: Prof. Jinyi Qi (UC Davis) & Richard Carson (Yale) & Hongdi Li (United Imaging). NIH BRAIN Initiative (U01 EB029811).

As Ph.D. Student

1. **Development and testing of a multimodal small-animal molecular imaging system prototype** (08/2012 – 12/2017). Leading Investigator: Prof. Qiushi Ren, Peking University. National Major Scientific Research Instrument Development Project.

HONORS & AWARDS

- Young Investigator Award (1st place), Society of Nuclear Medicine and Molecular Imaging (SNMMI), 2020
- Henry N. Wagner Best Paper Award, SNMMI, 2019
- Travel Award, IEEE Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC), 2020
- Travel Award, International Fully Three-Dimensional Image Reconstruction Meeting (Fully 3D), 2017

PROFESSIONAL SERVICE

- Member: Institute of Electrical and Electronics Engineers (IEEE); Society of Nuclear Medicine and Molecular Imaging (SNMMI); Steering Committee for Medical–Engineering Interdisciplinary Education in Higher Education, Ministry of Education, China.
- Journal reviewer: Nature Biomedical Engineering, Nature Machine Intelligence, Nature Communications, IEEE Transactions on Medical Imaging, IEEE Transactions on Radiation and Plasma Medical Sciences, IEEE Journal of Selected Topics in Signal Processing, Computerized Medical Imaging and Graphics, Physics in Medicine and Biology, Medical Physics, Nuclear Instruments and Methods in Physics Research Section A, BMC Research Notes.
- Conference reviewer: ICML, CVPR, AAAI, MICCAI, IEEE ISBI, IEEE NSS/MIC, IEEE EMBC.