

Heyuan Huang

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Education

Johns Hopkins University

July 2020-Now

Ph.D. candidate in Biomedical Engineering

University of Illinois at Urbana-Champaign

May 2020

Bachelor of Science in Physics

Bachelor of Science in Nuclear, Plasma, and Radiological Engineering

GPA:3.88

Honors

NPPE Roy A. Axford Undergraduate Scholarship

April 2018

NPPE Outstanding Undergraduate Research Award

April 2019

Dean's List

2016-2020

James Scholar Honor Program

2016-2020

Research Experience

I-Star Lab

Johns Hopkins University

Ph.D. Candidate

July 2020-Now

- Machine learning based motion management for cone-beam CT
- Deformable motion simulation and representation in CT
- Diffusion based low-dose to high-dose breast CT image synthesis

UIUC Radiological Instrumentation Laboratory

University of Illinois

Undergraduate Researcher

Fall 2017-Summer 2019

- PET imaging simulations and image reconstruction
- Random rejection algorithm for PET scans
- Amorphous selenium X-ray imagers

Stephens Family Clinical Research Institute

Carle Hospital

Undergraduate Research Affiliate

January 2018- November 2018

- PET imaging quantification improvement

GE Healthcare Internship

GE healthcare

Physics Intern

June 2018-August 2018

- Improved thallium doping control for X-ray imager production
- X-ray imager post-production data management and processing

Teaching Experience

Johns Hopkins University

Teaching Assistant

Principles and Applications of Modern X-ray Imaging and Computed Tomography
Spring 2022

Build an Imager

Spring 2023

Skills

Programming

MatLab (advanced), Python (advanced), C++ (functional), CUDA (basic)

Machine Learning Framework

PyTorch (advanced), TensorFlow (Basic)

Computing Clusters

SLURM (advanced), Linux (functional), RAID (basic)

Publication ([Google Scholar Page](#))

Journal Articles

H. Huang, Y. Liu, J.H. Siewerdsen, A. Lu, Y. Hu, W. Zbijewski, M. Unberath, C.R. Weiss, A. Sisniega, "Deformable Motion Compensation in Interventional Cone-Beam CT with a Context-Aware Learned Autofocus Metric," submitted (available upon request).

H. Huang, J.H. Siewerdsen, W. Zbijewski, C. R. Weiss, M. Unberath, T. Ehtiati, A. Sisniega, "Reference-free learning-based similarity metric for motion compensation in cone-beam CT," in *Physics in Medicine & Biology*.

<https://doi.org/10.1088/1361-6560/ac749a>

H. Huang and S. Abbaszadeh, "Recent Development of Amorphous Selenium-Based X-ray Detectors: A Review," in *IEEE Sensors Journal*.

<https://doi.org/10.1109/JSEN.2019.2950319>

A. Lu, **H. Huang**, Y. Hu, W. Zbijewski, M. Unberath, J.H. Siewerdsen, C.R. Weiss, A. Sisniega, "Vessel-Targeted Compensation of Deformable Motion in Interventional Cone-Beam CT," submitted (available upon request).

Conference Proceedings

H. Huang, J. H. Siewerdsen, A. Lu, Y. Hu, W. Zbijewski, M. Unberath, C. R. Weiss, and A. Sisniega, “Multi-stage Adaptive Spline Autofocus (MASA) with a learned metric for deformable motion compensation in interventional cone-beam CT”, Proc. SPIE 12463, Medical Imaging 2023: Physics of Medical Imaging, 1246314 (7 April 2023)
<https://doi.org/10.1117/12.2654361>

H. Huang, J.H. Siewerdsen, W. Zbijewski, C. R. Weiss, M. Unberath, A. Sisniega, “Context-Aware, Reference-Free Local Motion Metric for CBCT Deformable Motion Compensation,” in *Proceedings of 7th International Conference on Image Formation in X-Ray Computed Tomography*
<https://ct-meeting.org/wp-content/uploads/2022/06/CTMeetingProceedings2022.pdf>

H. Huang, J.H. Siewerdsen, W. Zbijewski, C. R. Weiss, T. Ehtiati, A. Sisniega, “Reference-Free, Learning-Based Rigid Motion Compensation in Cone-Beam CT for Interventional Neuroradiology, ” in *AAPM 63rd Annual Meeting & Exhibition*.
<https://w4.aapm.org/meetings/2021AM/programInfo/programAbs.php?sid=9204&aid=58688>

H. Huang, J.H. Siewerdsen, W. Zbijewski, C. R. Weiss, T. Ehtiati, A. Sisniega, “Reference-Free, Learning-Based Image Similarity: Application to Motion Compensation in Cone-Beam CT,” in *Proceedings of the 16th Virtual International Meeting on Fully 3D Image Reconstruction in Radiology and Nuclear Medicine*
<https://arxiv.org/abs/2110.04143>

A.Lu, **H. Huang**, Y. Hu, W. Zbijewski, M. Unberath, J.H. Siewerdsen, C.R. Weiss, and A. Sisniega, “Deformable motion compensation for intraprocedural vascular cone-beam CT with sequential projection domain targeting and vessel-enhancing autofocus”, Proc. SPIE 12466, Medical Imaging 2023: Image-Guided Procedures, Robotic Interventions, and Modeling, 124660P (3 April 2023)
<https://doi.org/10.1117/12.2652137>

A. Lu, **H. Huang**, M. Unberath , W. Zbijewski , J. H. Siewerssen, C.R. Weiss, A. Sisniega, “Compensation of deformable motion for vascular interventional cone-beam CT with a vessel-targeted approach,” *CARS 2022 Computer Assisted Radiology and Surgery*.

Y. Hu, **H. Huang**, J.H. Siewerdsen, W. Zbijewski, M. Unberath, C. R. Weiss, A. Sisniega, “Simulation of Random Deformable Motion in Soft Tissue Cone-Beam CT with Learned Models,” in *Proceedings of 7th International Conference on Image Formation in X-Ray Computed Tomography*
<https://ct-meeting.org/wp-content/uploads/2022/06/CTMeetingProceedings2022.pdf>

A. Sisniega, **H. Huang**, W. Zbijewski, J.W. Stayman, C. R. Weiss, T. Ehtiati, J. H. Siewerdsen, “Deformable Image-Based Motion Compensation for Interventional Cone-Beam CT with Learned Autofocus Metrics,” *SPIE Medical Imaging 2021: Physics of Medical Imaging*
<https://doi.org/10.1117/12.2582140>

A. Sisniega, A. Lu, **H. Huang**, W. Zbijewski, M. Unberath, J. H. Siewerssen, C.R. Weiss, “Targeted deformable motion compensation for vascular interventional cone-beam CT imaging,” *Proceedings of Medical Imaging 2022: Physics of Medical Imaging*.
<https://doi.org/10.1117/12.2613232>