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# KYONG HWAN JIN

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## Education

- **Ph.D. (2008-2015)** , Korea Advanced Institute of Science and Technology (KAIST), Dept. of Bio and Brain Engineering, South Korea.
  - Thesis : High speed imaging system and interpolation algorithm for irregularly undersampled data
  - Advisor : Jong Chul, Ye, Ph.D.
  - Keyword : Structured low rank matrix completion, Annihilation filter, Hankel matrix, Image inpainting, irregular sampling, parallel MRI, dynamic MRI, Compressed sensing, ADMM
- **B.S. (2004-2008)**, Korea Advanced Institute of Science and Technology (KAIST), Dept. of Bio and Brain Engineering, South Korea.

## Work Experience

- **Associate Professor (2023.09~ )**, Korea University, School of Electrical Engineering,
- **Assistant Professor (2021.02~ 2023.08)**, DGIST, Dept. of Electrical Engineering and Computer Science (EECS),
- **Staff Engineer (2019.09~ 2021.02)**, Samsung Reserach, Camera T/F - Global AI Center
- **Postdoc. (2016.06~ 2019.08)**, École polytechnique fédérale de Lausanne (EPFL), Biomedical Imaging Group (PI : Michael Unser)
- **Postdoc. (2015.03~2016.05)**, Korea Advanced Institute of Science and Technology (KAIST), Bioimaging Signal Processing Lab. (PI : Jong Chul, Ye)

## Research Interest

- *Machine learning, Signal/Image processing, Inverse problems, Video processing*

## Peer-reviewed Publications

- Minsu Kim, Yongjun Lee, Woo Kyoung Han, and K. H. Jin, “Learning Residual Elastic Warps for Image Stitching under Dirichlet Boundary Condition,” *IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*, 2024, Accepted
- Minsu Kim, Jaewon Lee, Byeonghun Lee, Sunghoon Im and K. H. Jin, “Implicit Neural Image Stitching With Enhanced and Blended Feature Reconstruction,” *IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*, 2024, Accepted
- M. Kang, P. Chikontwe, S. Kim, K. H. Jin, E. Adeli, K. M. Pohl, and Sang Hyun Park, “One-shot Federated Learning on Medical Data using Knowledge Distillation with Image Synthesis and Client Model Adaptation,” *Medical Image Computing and Computer Assisted Interventions (MICCAI)*, 2023, Accepted

- B. Pak, J. Lee, and K. H. Jin, “B-spline Texture Coefficients Estimator for Screen Content Image Super-Resolution,” *Proc. of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2023, **Highlight** (10% of accepted papers, 2.5% of submissions).
- W. K. Han, B. Lee, S. H. Park, and K. H. Jin, “ABCD : Arbitrary Bitwise Coefficient for De-quantization,” *Proc. of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2023.
- S. Shin, M. W. Kim, K. H. Jin, K. M. Yi, Y. Kohmura, T. Ishikawa, J. H. Je, and J. Park, “Deep 3D reconstruction of synchrotron X-ray computed tomography for intact lungs,” *Scientific Reports* 13, Article number:1738, 2023
- J. Lee, K. P. Choi, K. H. Jin, “Learning Local Implicit Fourier Representation for Image Warping,” *Proc. European Conference on Computer Vision (ECCV)*, 2022.
- J. Lee and K. H. Jin, “Local Texture Estimator for Implicit Representation Function,” *Proc. of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2022.
- J. Yoo, K. H. Jin, H. Gupta, J. Yerly, M. Stuber, and M. Unser, “Time-dependent Deep Image Prior for Dynamic MRI,” *IEEE Trans. on Medical Imaging* 40.12 (2021): 3337-3348, 2021
- K. H. Jin, “Deep Block Transform for Autoencoders,” *IEEE Signal Processing Letters*, vol.28: 1016-1019, 2021
- J. Min, K. H. Jin, M. Unser, and J. C. Ye, “Grid-Free Localization Algorithm Using Low Rank Hankel Matrix For Super-Resolution Microscopy,” *IEEE Trans. on Image processing*, vol. 27, no. 10, pp. 4771-4786, Oct. 2018.
- K. Lee, Y. Li, K. H. Jin, and J. C. Ye, “Unified Theory for Recovery of Sparse Signals in a General Transform Domain,” *IEEE Trans. on Information Theory*, vol. 64, no. 8, pp. 5457-5477, Aug. 2018.
- H. Gupta, K. H. Jin, Ha. Nguyen, M. T. McCann and M. Unser, “CNN-Based Projected Gradient Descent for Consistent Image Reconstruction,” *IEEE Trans. on Medical imaging*, vol. 37, no. 6, pp. 1440-1453, June 2018.
- H. Choi<sup>†</sup> and K. H. Jin<sup>†</sup>, “Predicting cognitive decline with deep learning of brain metabolism and amyloid imaging,” *Behavioural Brain Research*, vol 344, (2018), pp 103-109. <sup>†</sup> co-first author
- K. H. Jin and J. C. Ye, “Sparse and Low-Rank Decomposition of a Hankel Structured Matrix for Impulse Noise Removal,” *IEEE Trans. on Image processing*, vol. 27, no. 3, pp. 1448-1461, March 2018.
- M. T. McCann, K. H. Jin, and M. Unser, “Convolutional Neural Networks for Inverse Problems in Imaging: A Review.” *IEEE Signal Processing Magazine*, vol. 34, no. 6, pp. 85-95, Nov. 2017.
- K. H. Jin, M. T. McCann, E. Frosty, and M. Unser, “Deep Convolutional Network for Inverse Problems in Imaging,” *IEEE Trans. on Image processing*, vol. 26, no. 9, pp. 4509-4522, Sept. 2017.
- J. C. Ye, J. M. Kim, K. H. Jin, and K. Lee, “Compressive Sampling using Annihilating Filter-based Low-Rank Interpolation,” *IEEE Trans. on Information Theory*, vol. 63, no. 2, pp. 777-801, Feb. 2017.
- K. H. Jin, D. Lee, J. Um, J. Lee, S. Park and J. C. Ye, “MRI artifact correction using sparse + low-rank decomposition of annihilating filter-based Hankel matrix,” *Magnetic Resonance in Medicine* 78, no. 1 (2017): 327-340.
- H. Choi<sup>†</sup> and K. H. Jin<sup>†</sup>, “Fast and robust segmentation of the striatum using deep convolutional neural networks,” *Journal of Neuroscience Methods* 274 (2016): 146-153, <sup>†</sup> co-first author
- K. H. Jin, D. Lee, and J. C. Ye, “A general framework for compressed sensing and parallel MRI using annihilating filter based low-rank Hankel matrix,” *IEEE Trans. on Computational Imaging*, vol. 2, no. 4, pp. 480-495, Dec. 2016.
- D. Lee<sup>†</sup>, K. H. Jin<sup>†</sup>, E. Kim, S. Park, and J. C. Ye “Acceleration of MR parameter mapping using annihilating filter-based low rank Hankel matrix (ALOHA),” *Magnetic Resonance in Medicine* 76, no. 6 (2016): 1848-1864, <sup>†</sup> co-first author

- J. Lee<sup>†</sup>, K. H. Jin<sup>†</sup>, and J. C. Ye, “Reference-free single-pass EPI Nyquist ghost correction using annihilating filter-based low rank Hankel structured matrix,” *Magnetic Resonance in Medicine* 76, no. 6 (2016): 1775-1789, <sup>†</sup> co-first author
- K. H. Jin and J. C. Ye, “Annihilating filter based low rank Hankel matrix approach for image inpainting,” *IEEE Trans. on Image Processing*, vol. 24, no. 11, pp. 3498-3511, Nov. 2015.
- J. Lim, K. Lee, K. H. Jin, S. Shin, S. Lee, Y. Park, and J. C. Ye, “Comparative study of iterative reconstruction algorithms for missing cone problems in optical diffraction tomography”, *Optics Express* 23, no. 13 (2015): 16933-16948.
- D. Yee, K. H. Jin, J. S. Yahng, H. Yang, C. Y. Kim, and J. C. Ye, “High-speed terahertz reflection three-dimensional imaging using beam steering,” *Optics Express* 23, no. 4 (2015): 5027-5034.

*Before 2015, 7 papers have been published.*

## Invited Speech

- “Local Texture Estimator for Implicit Neural Representation,” UNIST Colloquium, 06APR2022, South Korea
- “Time-dependent Neural Network for Unsupervised Dynamic MRI Reconstructions,” ICAMD, 08DEC2021, Jeju, South Korea
- “Implicit Fourier representation for arbitrary-scale super resolutions,” Korean Computer Vision Society, 29NOV2021, South Korea
- “Machine Learning,” Gachon University, 18NOV2021, South Korea
- “Deep Networks for Inverse Problems : Application to Biomedical Imaging,” Korean Basic Science Institute, 05Dec 2019, South Korea
- “Deep Convolutional Neural Network for Inverse Problems in Imaging,” Turing/LMS Workshop, Inverse Problems and Data Science, 8-10 May 2017, Edinburgh, UK

## Awards

- 2019 IEEE SPS Best Paper Award for the noted paper : Kyong Hwan Jin, Michael T. McCann, Emmanuel Froustey, and Michael Unser, “Deep Convolutional Neural Network for Inverse Problems in Imaging” *IEEE Transactions on Image Processing*, Volume 26, No. 9, September 2017
- Grant on EPFL Fellows co-funded by Marie Skłodowska-Curie (2015 call, European Union’s Horizon 2020)  
(<http://research-office.epfl.ch/funding/internal-non-profit/epfl-fellows-marie-curie>)
- Samsung Humantech Paper Award - Silver Medal (2015, South Korea),  
(<https://humantech.samsung.com/saitext/index.jsp>)
- Samsung Humantech Paper Award - Participation Prize (2004, South Korea)
- The Presidential Science Scholarship (2004-2008, South Korea)

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