

Heung-No Lee, Ph.D.



Professor

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Last updated in August, 2025 (visit his home page for latest information)

Professional Interest

The candidate is seeking a professional opportunity for teaching, research and startup. Primary teaching interests include machine learning, communications, information theory, and signal processing. Research and startup interests include *machine learning, computational intelligence, networks and blockchains*.

Education

- **Ph.D. in Electrical Eng., University of California, Los Angeles, Dec. 1999**
 - *Title of Dissertation: Adaptive Diversity Combining, Equalization and Sequence Decoding for Time-Varying Dispersive Channels*
 - Advisor: Gregory J. Pottie, Ph.D.
- **M.S. in Electrical Eng., University of California, Los Angeles, Dec. 1994**
- **B.S. in Electrical Eng., University of California, Los Angeles, June 1993**

Professional Positions Held

- **Member (Appointed), 3rd Artificial Intelligence Industry Committee**
2025.11 – 2027.11

- **Director of ITRC Blockchain Intelligence Convergence Research Center**
2021.7 – 2029.6
- **Director of AI Research Institute, GIST, Korea**
2021.1 – 2023.1
- **Advisory member of The Presidential Commission on Policy Planning**
2020.9 – 2022.9
- **CEO of LiverVance Co., Ltd. GIST Professor Start-up Venture**
2020.1 – Present
- **Blockchain Advisory Committee of Korea Post Information Center**
2018.10 – 2019.12
- **Director of Blockchain Internet Economic Research Center, GIST, Korea,**
2018.8 – Present
- **Chairman of Communications Society of The Institute of Electronics Engineers of Korea, 2017.1 – 2019.12**
- **JCCI Academic Vice President of the Korean Institute of Communication Sciences, 2017.1 – 2017.12**
- **Vice Chairman of The Institute of Electronics Engineers of Korea (Registered Director) , 2017.1 – 2018.12**
- **Future Science & Technology Holding Co., Ltd., Executive Director,**
2016.9 – 2017.11
- **Research Director, GIST, Korea, 2016.9 – 2017.11**
- **Director of Research Policy Center, GIST, Korea, 2016.9 – 2017.05**
- **Director of Intelligent Sensors Research Center, GIST, Korea,**
2015.12 – Present
- **Member of R & D Special Zone Committee of Future Creation Science Department, 2015.12 – 2017.12**
- **Executive Director, Academic, Planning Department of The Institute of Electronics Engineers of Korea, 2015, 2016**
- **Visiting Professor, Choonam National University Hospital, 2012 – 2016**
- **Professor, GIST, Korea School of Electrical Engineering and Computer Science, 2009.1 – Present**
- **Assistant Professor, the University of Pittsburgh, Pittsburgh, U.S.A. Electrical and Computer Eng. Department, 2002.1 – 2008.12**
- **Research Staff Member, HRL Laboratories, L.L.C., (Formerly Hughes Research Laboratories) Information Science Laboratory, 1999.12 – 2002.1**

Awards and Honors

- Awarded the Prime Minister's Commendation at the 55th Science Day (Sensor Intelligence and Machine Learning), Apr. 25th, 2022
- GIST Education Innovation Award 2021
- Korean Society of Electronic Engineering Haedong scholarly Award 2019
- GIST Research Award 2016 (for Contribution to Industrialization)
- Top 11 Research Outcomes of GIST, 2016
- National Research Foundation, This Month Science/Engineer Award, January 2014
- Top 50 Achievements of National Research and Development, awarded by National Research Foundation of Korea, Oct. 15th, 2013
- Top 100 Achievements of National Research and Development, awarded by Korean Ministry of Science, ICT and Planning, August, 28th, 2013
- Best Poster Award at the 6th International Symposium for Aging, Gwangju, Korea, Oct. 20th, 2012
- National Research Laboratory of Korea, 2010, National Research Foundation.
- University of Pittsburgh Central Research Development Grant Awards: 2002, 2005
- Pittsburgh Digital Greenhouse Research Grant Award 2002
- Who's who in America, nominated in 2001 and 2005.
- Departmental Scholar awarded upon graduation of UCLA, 1993
- Graduated UCLA as an Honor Student (Cum Laude)
- Member of Tau Beta Phi honor society

International Journal Editorship/ Group Membership

- Associate Editor for IEEE Transactions on Cybernetics, since 2022 - present
- Elected Member of IEEE Computational Imaging Special Interest Group, Jan. 2017 - Dec. 2019
- Area Editor for AEU--International Journal of Electronics and Communications. Areas include channel coding, information theory, signal processing, communications theories. January 2013 - 2016

- Lead Guest Editor for EURASIP Journal on Wireless Communications and Networking. Special Issue on Networking Coding for Wireless Networks, Other Guest Editors: Sae-Young Chung (KAIST), Christina Fragouli (EPFL), and Zhi-Hong Mao (University of Pittsburgh)

Professional Society Activities

International Technical Program Committees

- IEEE WCNC 2013, IEEE Globecom 2013 (Wireless Network), IEEE International Conference on Communications 2013 (Wireless Network)
- IEEE PIMRC 2012, 2013: Wireless Networks and Cross-Layer Tracks
- IEEE International Conference on Communications 2012: Wireless Network Symposium.
- IEEE International Conference on Communications 2012: Ad-hoc and Sensor Networking Symposium.
- IEEE Globecom 2009, Nov.30th-Dec. 4th, Honolulu, Hawaii, USA
- IEEE/CME International Conference on Complex Medical Engineering 2009: April 9-11 at Tempe, AZ, USA
- IEEE International Conference on Communications 2008: Communication Theory Symposium, Beijing, China.
- International Wireless Communications & Mobile Computing Conference, MIMO Systems Symposium, August 12-16, 2007, Turtle Bay Resort, Honolulu, Hawaii.
- IEEE International Conference on Communications 2007: Communication Theory Symposium, Scotland.
- IEEE International Conference on Communications 2005: Communication Theory Symposium, Seoul, Korea

IEEE Chapters

- Gwangju Section Chair, Jan. 2013 – Feb. 2017
- Gwangju Section Secretary, Jan. 2010 – Dec. 2012
- Pittsburgh Chapter Chair for IEEE Signal Processing Society, June 2005 -- Dec. 2008.

IEEE Conference Session Chairs

- IEEE Wireless Communications and Network Conference, Las Vegas, Nevada, USA
- IEEE International Conference on Communications 2005: Communication Theory Symposium

Panels for Competitive National Science Foundation Programs (U.S.A.)

- SBIR/STTR: Wireless Sensor Networks, program director: Dr. Murali Nair, Date July 31st, 2007.
- CISE Networking Division, NeTS: Service Date: June 1-2, 2006, Program Director: Du David.
- CISE Networking Division, NeTS: NOSS-Panel, Service Date: April 20-21, 2006, Program director: Guru Parulkar.
- SBIR/STTR, program director: Dr. Murali Nair, date: August 26, 2005.
- CISE Networking Division, Service Date: May 9-10th, 2005. Program Director: Dr. Joseph Evans.
- SBIR, program director: Dr. Murali Nair, date: September 15, 2003.

Publications

Books/Book Chapters

- A. Kumar, B. Kuldeep, I. Sharma, G. K. Singh, Heung-No Lee, “Advances in Multirate Filterbanks: a research survey”, *Advances in Multirate Systems*, Springer.
- B. Kuldeep, A. Kumar, G. K. Singh, Heung-No Lee, “Design of Multi-channel Filterbank using Minor Component Analysis and Fractional derivative Constraints”, *Advances in Multirate Systems*, Springer.
- A. Vishawkarma, A. Kumar and Heung-No Lee, “Design of Non-uniform Linear-Phase Transmultiplexer System for Communication”, *Advances in Multirate Systems*, Springer.
- Soogil Woo, Seungchan Lee, Younghak Shin, Heung-No Lee, *Review of Applications for Wireless Brain-Computer Interface systems, Emerging Theory and Practice in Neuroprosthetics*, Chapter 8, IGI Global, Pennsylvania, U.S.A., 2014.
- Seungchan Lee, Younghak Shin, Soogil Woo, and Heung-No Lee, *A Review of Wireless Brain-Computer Interface systems, Brain-Computer Interface*, Chapter 11, InTech, June, 2013
- Jae-Gun Choi, Sang-Jun Park, and Heung-No Lee, *Intelligent Sensor Networks: Across Sensing, Signal Processing, and Machine Learning*, Chapter 15, Taylor & Francis LLC, CRC Press, 2012.
- Heung-No Lee, *Adaptive Wireless Transceivers*, Lambert Academic Publishing, ISBN 978-3-8383-1889-9, Saarbrücken, Germany, 2010.
- Heung-No Lee, *Adaptive Diversity Combining, Equalization, and Sequence Decoding*, Ph.D. Dissertation, UCLA, 1999.

Refereed Journals

[+ Students, Postdoc++, * Corr]

1. H. Choi, S. Kim, and H.-N. Lee, “Error-Correction Code Verifiable Computation Consensus,” *IEEE Transactions on Information Forensics and Security*, vol. 20, pp. 6678-6692, June 2025. DOI: 10.1109/TIFS.2025.3581028.
2. D. S. Bhatti, J. Lee, C. Kim, Y. Choi, H. H. Yoon, and H.-N. Lee, “Deep learning-based single-shot computational spectrometer using multilayer thin films,” *Scientific Reports*, vol. 15, p. 21232, July 2025. DOI: 10.1038/s41598-025-06691-6
3. Bhatti, D.S., Haroon, M.A., Choi, H. *et al.* Outage reduction in 5G uplink cooperative NOMA using PSO-optimized relay selection and successive interference cancelation. *J Wireless Com Network* 2025, 47 (2025). <https://doi.org/10.1186/s13638-025-02448-x>

4. Rahman S M Wahidur+, Ishmam Tashdeed, Manjit Kaur, and Heung-No Lee*, "Enhancing Zero-Shot Crypto Sentiment with Fine-tuned Language Model and Prompt Engineering", *IEEE Access*, vol. 12, pp. 10146-10159, 2024.
5. Raina, R., Gondhi, N.K., Chahat et al. and Heung-No Lee*, "A Systematic Review on Acute Leukemia Detection Using Deep Learning Techniques" *Arch. Computat. Methods Eng.* 30, 251–270 2023.
6. D. Singh, M. Kaur, J. M. Alanazi, A. A. AlZubi and Heung-No Lee*, "Efficient Evolving Deep Ensemble Medical Image Captioning Network," *IEEE Journal of Biomedical and Health Informatics*, vol. 27, no. 2, pp. 1016-1025, Feb. 2023.
7. Pal, Hardev Singh, et al. and Heung-No Lee*, "An effective ECG signal compression algorithm with self controlled reconstruction quality." *Computer Methods in Biomechanics and Biomedical Engineering* 27.7, 849-859, 2024.
8. D. Srivastava, S. S. Singh, B. Rajitha, M. Verma, M. Kaur and Heung-No Lee*, "Content-Based Image Retrieval: A Survey on Local and Global Features Selection, Extraction, Representation, and Evaluation Parameters," *IEEE Access*, vol. 11, pp. 95410-95431, 2023.
9. M. Kaur et al. and Heung-No Lee*, "EGCrypto: A Low-Complexity Elliptic Galois Cryptography Model for Secure Data Transmission in IoT," *IEEE Access*, vol. 11, pp. 90739-90748, 2023.
10. Singhai, P., Kumar, A., Ateek, A. et al. and Heung-No Lee*, "ECG Signal Compression Based on Optimization of Wavelet Parameters and Threshold Levels Using Evolutionary Techniques", *Circuits Syst. Signal Process* 42, 3509–3537, 2023.
11. Kaur, M., Singh, D., Jabarulla, M.Y. et al. and Heung-No Lee*, "Computational deep air quality prediction techniques: a systematic review." *Artif. Intell. Rev.* 56 (Suppl 2), 2053–2098, 2023.
12. M. Kaur, D. Singh, V. Kumar and Heung-No Lee*, "MLNet: Metaheuristics-Based Lightweight Deep Learning Network for Cervical Cancer Diagnosis," *IEEE Journal of Biomedical and Health Informatics*, vol. 27, no. 10, pp. 5004-5014, Oct. 2023.
13. J. Su, Z. Liao, Z. Sheng, A. X. Liu, D. Singh. and Heung-No Lee*, "Human Activity Recognition Using Self-Powered Sensors Based on Multilayer Bidirectional Long Short-Term Memory Networks," *IEEE Sensors Journal*, vol. 23, no. 18, pp. 20633-20641, 15 Sept.15, 2023.
14. Singh, Shashank Sheshar, et al. and Heung-No Lee*, "Social network analysis: a survey on measure, structure, language information analysis, privacy, and applications." *ACM Transactions on Asian and Low-Resource Language Information Processing* 22.5: 1-47, 2023.

15. Kaushik, Harshit, et al. and Heung-No Lee*, "TomFusioNet: A tomato crop analysis framework for mobile applications using the multi-objective optimization based late fusion of deep models and background elimination." *Applied Soft Computing* 133: 109898, 2023.
16. M. Kaur, A. A. AlZubi, D. Singh, V. Kumar and Heung-No Lee*, "Lightweight Biomedical Image Encryption Approach," *IEEE Access*, vol. 11, pp. 74048-74057, 2023.
17. Pal, Hardev Singh, et al. and Heung-No Lee*, "Electrocardiogram signal compression using adaptive tunable-Q wavelet transform and modified dead-zone quantizer." *ISA transactions* 142: 335-346, 2023.
18. Jusung Kang+, Young-Sik Kim, and Heung-No Lee*, "Radio Frequency Public Key Generator for Digital Application", *IEEE Access*, Vol. 11, Dec. 2023, doi: 10.1109/ACCESS.2023.3340305, (ITRC project), (Impact factor: 3.9, Category: Engineering, Electrical & Electronic, JCI Quartile: Q2, JCI Percentile: 69.12)
19. Heung-No Lee*, Young-Sik Kim, Dilbag Singh, and Manjit Kaur, "Green Bitcoin: Global Sound Money," *The Journal of Digital Assets*, Vol.1, No. 1, pg. 33-47, October, 2022. (The Inaugural Issue of the Journal of Digital Assets, No Impact Factor)
20. Cheolsun Kim+, Pavel Ni+, Kang Ryeol Lee, and Heung-No Lee*, "Mass production-enabled computational spectrometers based on multilayer thin films", *Scientific Reports*, (Impact Factor: 4.380, Category: Multidisciplinary Sciences, JCI Quartile: Q1: JCI Percentile: 85.55, Do-Yak project)
21. Kaur, S., Singh, S., Kaur, M. *et al.* and Heung-No Lee*, "A Systematic Review of Computational Image Steganography Approaches", *Arch Computat Methods Eng* 29, 4775–4797, 2022.
22. Himthani, V., Dhaka, V.S., Kaur, M. *et al.* and Heung-No Lee*, "Comparative performance assessment of deep learning based image steganography techniques", *Sci. Rep.* 12, 16895, 2022.
23. Pallavi, Joshi, S., Singh, D. *et al.* and Heung-No Lee*, "Comprehensive Review of Orthogonal Regression and Its Applications in Different Domains", *Arch. Computat. Methods Eng.* 29, 4027–4047, 2022.
24. Raina, R., Gondhi, N.K., Chaahat et al. and Heung-No Lee*, "A Systematic Review on Acute Leukemia Detection Using Deep Learning Techniques", *Arch. Computat. Methods Eng.* 30, 251–270, 2023.
25. Kumar, A., Kumar, A., Vishwakarma, A., and Heung-No Lee*, "An improved segmentation technique for multilevel thresholding of crop image using cuckoo search algorithm based on recursive minimum cross entropy", *IET Signal Processing*, 16(6), 630-649, 2022.

26. H. Singh, S. Sharma, M. Khurana, M. Kaur and Heung-No Lee*, "Binary Drone Squadron Optimization Approaches for Feature Selection," *IEEE Access*, vol. 10, pp. 87099-87114, 2022.
27. Kshirsagar, Pravin R., et al. and Heung-No Lee*, "Perception exploration on robustness syndromes with pre-processing entities using machine learning algorithm." *Frontiers in Public Health* 10, 893989, 2022.
28. Kour, Kanwalpreet, Deepali Gupta, Kamali Gupta, Sapna Juneja, Manjit Kaur, Amal H. Alharbi, and Heung-No Lee*. "Controlling Agronomic Variables of Saffron Crop Using IoT for Sustainable Agriculture" *Sustainability* 14, no. 9: 5607, 2022.
29. S. S. Kushwaha, S. Joshi, D. Singh, M. Kaur and Heung-No Lee*, "Ethereum Smart Contract Analysis Tools: A Systematic Review," *IEEE Access*, vol. 10, pp. 57037-57062, 2022.
30. J. Piri et al. and Heung-No Lee*, "Mining and Interpretation of Critical Aspects of Infant Health Status Using Multi-Objective Evolutionary Feature Selection Approaches," *IEEE Access*, vol. 10, pp. 32622-32638, 2022.
31. R. Subramanian, S. Taterh, D. Singh and Heung-No Lee*, "Efficient Fine Tuned Trapezoidal Fuzzy-Based Model for Failure Mode Effect Analysis Risk Prioritization," *IEEE Access*, vol. 10, pp. 50037-50046, 2022.
32. Kshirsagar, Pravin R., Hariprasath Manoharan, S. Shitharth, Abdulrhman M. Alshareef, Dilbag Singh, and Heung-No Lee*. "Probabilistic Framework Allocation on Underwater Vehicular Systems Using Hydrophone Sensor Networks" *Water* 14, no. 8: 1292, 2022.
33. D. Singh, M. Kaur, V. Kumar, M. Y. Jabarulla and Heung-No Lee*, "Artificial Intelligence-Based Cyber-Physical System for Severity Classification of Chikungunya Disease," *IEEE Journal of Translational Engineering in Health and Medicine*, vol. 10, pp. 1-9, 2022.
34. Singh, Dilbag, Yavuz Selim Taspinar, Ramazan Kursun, Ilkay Cinar, Murat Koklu, Ilker Ali Ozkan, and Heung-No Lee*. "Classification and Analysis of Pistachio Species with Pre-Trained Deep Learning Models" *Electronics* 11, no. 7: 981, 2022.
35. H. Singh, A. Kumar, L. K. Balyan and Heung-No Lee*, "Spatial Entropy Quartiles-Based Texture-Aware Fractional-Order Unsharp Masking for Visibility Enhancement of Remotely Sensed Images," *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, vol. 52, no. 4, pp. 2275-2288, April 2022
36. Malhotra, Priyanka, Sheifali Gupta, Deepika Koundal, Atef Zaguia, Manjit Kaur, and Heung-No Lee*. "Deep Learning-Based Computer-Aided Pneumothorax Detection Using Chest X-ray Images" *Sensors* 22, no. 6: 2278, 2022.

37. D. Singh, M. Kaur, M. Y. Jabarulla, V. Kumar and Heung-No Lee*, "Evolving Fusion-Based Visibility Restoration Model for Hazy Remote Sensing Images Using Dynamic Differential Evolution," *IEEE Transactions on Geoscience and Remote Sensing*, vol. 60, pp. 1-14, 2022.
38. Mishra, Abhinav, Ganapathiraju Dharahas, Shilpa Gite, Ketan Kotecha, Deepika Koundal, Atef Zaguia, Manjit Kaur, and Heung-No Lee*. "ECG Data Analysis with Denoising Approach and Customized CNNs" *Sensors* 22, no. 5: 1928, 2022.
39. Aggarwal, Apeksha, Akshat Srivastava, Ajay Agarwal, Nidhi Chahal, Dilbag Singh, Abeer Ali Alnuaim, Aseel Alhadlaq, and Heung-No Lee*. "Two-Way Feature Extraction for Speech Emotion Recognition Using Deep Learning" *Sensors* 22, no. 6: 2378, 2022.
40. M. Indushree, Manjit Kaur, Manish Raj, Shashidhara R., and Heung-No Lee*. "Cross Channel Scripting and Code Injection Attacks on Web and Cloud-Based Applications: A Comprehensive Review" *Sensors* 22, no. 5: 1959 2022.
41. Dixit, Mayank, et al. and Heung-No Lee*. "6+: A Novel Approach for Building Extraction from a Medium Resolution Multi-Spectral Satellite" *Sustainability* 14, no. 3: 1615. 2022.
42. Bondada, Praveen, Debabrata Samanta, Manjit Kaur, and Heung-No Lee*. "Data Security-Based Routing in MANETs Using Key Management Mechanism" *Applied Sciences* 12, no. 3: 1041, 2022.
43. S. S. Kushwaha, S. Joshi, D. Singh, M. Kaur and Heung-No Lee*, "Systematic Review of Security Vulnerabilities in Ethereum Blockchain Smart Contract," *IEEE Access*, vol. 10, pp. 6605-6621, 2022.
44. Singh, Debabrata, Anil Kumar Biswal, Debabrata Samanta, Dilbag Singh, and Heung-No Lee*. "Juice Jacking: Security Issues and Improvements in USB Technology" *Sustainability* 14, no. 2: 939, 2022.
45. A. Kumar et al., and Heung-No Lee*, "Efficient Stochastic Model for Operational Availability Optimization of Cooling Tower Using Metaheuristic Algorithms," *IEEE Access*, vol. 10, pp. 24659-24677, 2022.
46. B. Mishra et al. and Heung-No Lee* , "Privacy Protection Framework for Android," *IEEE Access*, vol. 10, pp. 7973-7988, 2022,
47. V. Himthani, V. S. Dhaka, M. Kaur, D. Singh and Heung-No Lee*, "Systematic Survey on Visually Meaningful Image Encryption Techniques," *IEEE Access*, vol. 10, pp. 98360-98373, 2022.
48. G. D. Singh, M. Prateek, S. Kumar, M. Verma, D. Singh and Heung-No Lee* "Hybrid Genetic Firefly Algorithm-Based Routing Protocol for VANETs," *IEEE Access*, vol. 10, pp. 9142-9151, 2022.

49. Jusung Kang+, Younghak Shin, Hyunku Lee, Jintae Park, and Heung-No Lee*, "Radio Frequency Fingerprinting for Frequency Hopping Emitter Identification", *Applied Sciences*, 11(22), Nov. 2021, doi: 10.3390/app112210812 (LIG Nex1 project), (Impact factor: 2.679, Category: Engineering, Multidisciplinary, JCI Quartile: Q2, JCI Percentile: 67.94)
50. D. Singh, V. Kumar, M. Kaur, M. Y. Jabarulla and Heung-No Lee*, "Screening of COVID-19 Suspected Subjects Using Multi-Crossover Genetic Algorithm Based Dense Convolutional Neural Network," in *IEEE Access*, vol. 9, pp. 142566-142580, 2021, doi: 10.1109/ACCESS.2021.3120717.
51. Hyongsung Kim+, Jehyuk Jang+, Sangjun Park+, and Heung-No Lee*, "Error-Correction Code Proof-of-Work on Ethereum", *IEEE Access*, Vol. 9, pp. 135942-135952, Sep 2021. doi: <https://doi.org/10.1109/ACCESS.2021.3113522> (Impact Factor: 3.367, IITP & Do-Yak project) Paper: (Open Access)
52. Jabarulla, Mohamed Yaseen, and Heung-No Lee*. "A blockchain and artificial intelligence-based, patient-centric healthcare system for combating the COVID-19 pandemic: Opportunities and applications." *Healthcare*. Vol. 9. No. 8. Mdpi, 2021.
53. Haeung Choi+, Sangjun Park+ and Heung-No Lee*, "Covert Anti-Jamming Communication Based on Gaussian Coded Modulation", *Applied Sciences*, 11(9), April 2021, doi: <https://doi.org/10.3390/app11093759> (EW33 project), (Impact factor: 2.679, Category: Engineering, Multidisciplinary, JCI Quartile: Q2, JCI Percentile: 67.94)
54. H. Singh, A. Kumar, L.K.Balyan and Heung No Lee*, "Spatial Entropy Quartiles based Texture Aware Fractional-order Unsharp Masking for Visibility Enhancement of Remotely Sensed Images", *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, (Impact Factor: 9.309, Do-Yak project)
55. Nikhil Agrawal, Anil Kumar, B. Kuldeep, S. Lee, H. N. Lee*, "Weighted Least Square Design Technique for Hilbert Transformer using Fractional Derivative", *Signal, Image and Video Processing* (Springer), Accepted (Impact factor: 1.794, Do-Yak project)
56. Mohamed Yaseen Jabarulla+ and Heung-No Lee*, "Blockchain-Based Distributed Patient-Centric Image Management System", *Applied Sciences*, 11(1), 196, Dec. 2020. doi: <https://doi.org/10.3390/app11010196>. (IF: 2.474, Do-Yak and IITP)
57. Jehyuk Jang+ and Heung-No Lee, "Profitable Double-Spending Attacks," *Applied Sciences*, 10, 8477, .Nov. 2020. doi: <https://doi.org/10.3390/app10238477>. (IF: 2.474, Do-Yak and IITP)
58. Pavel Ni+, Heung-No Lee*, "High-Resolution Ultrasound Imaging Enabled by Random Interference and Joint Image Reconstruction", *Sensors* 2020, 20(22), 6434 (impact Factor: 3.275, Do-Yak project)

59. Hyunjun Jung+, Heung-No Lee*, “ECCPoW: Error-Correction Code Based Proof-of-Work for ASIC Resistance”, *Symmetry*, June. 2020, Vol.12(6), 988 (impact Factor: 2.143, Do-Yak project)
60. Pavel S. Ni+, and Heung-No Lee*, “High-Resolution Ultrasound Imaging Using Random Interference“, *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control (T-UFFC)*, March. 2020. (Impact Factor: 2.989, Do-Yak project)
61. Cheolsun Kim+, Dongju Park+, and Heung-No Lee*, “Compressive sensing spectroscopy using a residual convolutional neural network”, *MDPI Sensors*, Vol. 20(3), Jan. 2020. (Impact Factor: 3.031, Do-Yak project)
62. Seungchan Lee+, Younghak Shin+, Anil Kumar, Kiseon Kim, and Heung-No Lee*, “Two-Wired Active Spring-Loaded Dry Electrodes for EEG Measurements”, *MDPI Sensors*, Vol.19, No.20, Article 4572, Oct. 2019. (Impact Factor: 3.031, Do-Yak project, Brain research project)
63. H. Singh, A. Kumar, L.K. Baylan, and Heung-No Lee*, “Optimally sectioned and successively reconstructed histogram sub-equalizaion based gamma correction for satellite image enhancement”, *Multimedia Tools and Applications*, Vol.2019, No.78, pp20431-20463, Jul.2019 (Impact Factor : 2.101, Doyak Project)
64. H. Singh, A. Kumar, L.K. Baylan, and Heung-No Lee*, “Fractional Order Integration Based Fusion Model for Piecewise Gamma Correction along with Textural Improvement for Satellite Images,” *IEEE Access*, Accepted. (Impact Factor: 3.244, Doyak Project)
65. Kiwon Yang+, Jusung Kang+, Jehyuk Jang+ and Heung-No Lee*, “Multimodal Sparse Representation-Based Classification Scheme for RF Fingerprinting,” *IEEE Communications Letters*, Vol.23, Issue 5, pp867-870, May 2019 (Impact Factor: 2.723, Doyak Project)
66. Anil Kumar, Seungchan Lee+ and Heung-No Lee* , “A New Design Method for FIR Notch Filter using Fractional Derivative and Swarm Intelligence,”, *Sadhana*, 2019 (Impact Factor: 0.592, Doyak Project) .
67. Cheolsun Kim+. Woong-Bi Lee+, Soo Kyung Lee, Yong Tak Lee, and Heung-No Lee*, “Fabrication of 2D thin-film filter-array for compressive sensing spectroscopy”, *Optics and Lasers in Engineering*, Vol. 115, pp. 53-58, Apr. 2019. (Impact Factor: 3.388 Doyak project)
68. Sangjun Park and Heung-No Lee*, “Fast Mixed Integer Quadratic Programming for Sparse Signal Estimation,” *IEEE Access*, Accepted. (Impact Factor: 3.244, Doyak Project)
69. Iqbal Zafar, Heung-No Lee*, Saeid Nooshabadi, ”Highly Reliable Decision-Making Using Reliability Factor Feedback for Factory Condition Monitoring via

- WSNs”, *Wireless Communications and Mobile Computing*, Vol. 2018, Oct. 2018. (Impact Factor:0.869, Doyak project)
70. Anil Kumar, N. Agrawal, I. Sharma, Seungchan Lee, and Heung-No Lee*, “Hilbert Transform Design based on Fractional Derivatives and Swarm Optimization,” *IEEE Trans. on Cybernetics*, Early Access, 2018 (Impact Factor: 8.80, Doyak Project)
 71. Seonggeon Kim, Uihyun Yun, Jehyuk Jang, Geunsu Seo, Jongjin Kang, Heung- No Lee, Minjae Lee *, “Reduced Computational Complexity Orthogonal Matching Pursuit Using a Novel Partitioned Inversion Technique for Compressive Sensing,” *Electronics*, Vol.7, No.9, Sep. 2018 Impact Factor: 2.11)
 72. Seungchan Lee+, Younghak Shin+, Anil Kumar, Minhee Kim, and Heung-No Lee*, “Dry Electrode-based Fully Isolated EEG/fNIRS Hybrid Brain-monitoring System”, *IEEE Trans. on Biomedical Engineering*. Early Access. 2018. (Impact Factor: 4.28, Do-Yak project, Brain research project)
 73. Mohamed Yaseen Jabarulla+ and Heung-No Lee, “Speckle Reduction on Ultrasound Liver Images Based on a Sparse Representation over a Learned Dictionary” *Applied Sciences-MDPI*. Vol. 8, no, 6, pp 903, May. 2018. (Impact Factor: 1.689, Do-Yak Project)
 74. Jehyuk Jang+ Sanghun Im, and Heung-No Lee*, “Intentional Aliasing Method to Improve Sub-Nyquist Sampling System”, *IEEE Transactions on Signal Processing*, Vol. 66 (No.12), pp. 3311-3326, Jun. 2018 (Impact Factor: 4.300, Hanwha project)
 75. Mohamed Yaseen Jabarulla+ and Heung-No Lee*, “Speckle Reduction on Ultrasound Liver Images Based on a Sparse Representation over a Learned Dictionary” *Applied Sciences-MDPI*, Vol. 8 (No.6), pp. 903, May. 2018 (Impact Factor: 1.679, Do-Yak Project)
 76. Woong-Bi Lee+, and Heung-No Lee*, “Depth-estimation-enabled compound eyes,” *Optics Communications*, Vol. 412, pp. 178-185, Apr. 2018 (Impact Factor: 1.588, Do-Yak Project)
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