**Heung-No Lee, Ph.D.**



**Professor**

**GIST (Gwangju Inst. of Sci. and Tech.)**

**261 Cheomdan Gwagiro (Oryong dong), Buk-gu**

**Gwangju 61005, Republic of Korea**

**Phone: +(82) 62-715-2237**

**FAX: +(82) 62-715-2204**

E-mail: [heungno@gist.ac.kr](mailto:heungno@gist.ac.kr)

Home-page: <https://heungno.net/>

Last updated in August, 2024 (visit his home page for lastest 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 interestsinclude *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

* Director of ITRC Blockchain Inteligence 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
* 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. D. S. Bhatti, S. Saleem, and Heung-No Lee, and K.-I. Kim, “A Dynamic Symmetric Key Generation at Wireless Link Layer: Information-Theoretic Perspectives,” *EURASIP Journal on Wireless Communications and Networking*, IF 2.3, Springer, 2024.
2. 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.
3. 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.
4. 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.
5. 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.
6. 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.
7. 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.
8. 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.
9. 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.
10. 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.
11. 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.
12. 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.
13. 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.
14. 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.
15. 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.
16. 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)
17. 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)
18. 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)
19. 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.
20. 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.
21. 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.
22. 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.
23. 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.
24. 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.
25. 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.
26. 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.
27. 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.
28. 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.
29. 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.
30. 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.
31. 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.
32. 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.
33. 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
34. 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.
35. 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.
36. 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.
37. 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.
38. 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.
39. 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.
40. 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.
41. 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.
42. 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.
43. 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.
44. B. Mishra et al. and Heung-No Lee\* , "Privacy Protection Framework for Android," *IEEE Access*, vol. 10, pp. 7973-7988, 2022,
45. 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.
46. 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.
47. 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)
48. 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.
49. Hyoungsung 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)
50. 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.
51. 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)
52. 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)
53. 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)
54. 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)
55. 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)
56. 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)
57. 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)
58. 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)
59. 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)
60. 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)
61. **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)
62. **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)
63. **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)
64. **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) .
65. **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)
66. **Sangjun Park and Heung-No Lee**\*, “Fast Mixed Integer Quadratic Programming for Sparse Signal Estimation,” IEEE Access, Accepted. (Impact Factor: 3.244, Doyak Project)
67. **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)
68. **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)
69. **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)
70. **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)
71. **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)
72. **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)
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: 1.679, Do-Yak Project)
74. **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)
75. **Richa Khokhra, Bandna Bharti, Heung-No Lee**\***, and Rajesh Kumar**\*, “Visible and UV photo-detection in ZnO nanostructured thin films via simple tuning of solution method,” published online in Scientific Reports-Nature, Nov. 2017 (Impact Factor:4.259, Do-Yak Project)
76. **M. asif raza+, Zafar Iqbal+, Sang-Seon Byun, Hyunduk Kang, Heung-No Lee**\***,** “A Versatile Coexistence Decision-Making System for Efficient TV Whitespace Sharing among Whitespace Objects.” Wireless Communications and Mobile Computing, Aug. 2017 (Impact Factor 1.899)
77. A. Kumar, B. Kuldeep, G. K. Singh and Heung No Lee, “An Improved Design Method based on Polyphase Components for Digital FIR Filters,” *International Journal of Electronics* (Impact Factor: 0.729, Acknowledgement – None)
78. Mohamed Yaseen J+ and Heung-No Lee\*, “Computer Aided Diagnostic System for Ultrasound Liver Images: A Systematic Review,” *Optik – International Journal for Light and Electron Optics*, Vol. 140, pp. 1114-1126, Jul. 2017. (Impact Factor: 0.835, Do-Yak Project)
79. Muhammad Asif Raza+, Sangjun Park+ and Heung-No Lee\*, “Evolutionary Channel Sharing Algorithm for Heterogeneous Unlicensed Networks,” *IEEE Transactions on Wireless Communications* (Early Access) (Impact Factor: 4.951, Do-Yak Project)
80. Ranjeet Kumar, Anil Kumar, G.K. Singh, and Heung-No Lee, “Efficient compression technique based on temporal modelling of ECG signal using principle component analysis,” *IET Science Measurement & Technology*, Vol. 11, No. 3, pp. 346-353, May, 2017. (Impact Factor: 1.263, Acknowledgement – None)
81. Sangjun Park+, Nam Yul Yu, Heung-No Lee\*, “An Information-Theoretic Study for Joint Sparsity Pattern Recovery with Different Sensing Matrices,” *IEEE Transactions on Information Theory* (Early Access) (Impact Factor: 2.679, Do-Yak Project)
82. I. Sharma, A. Kumar, and G. K. Singh, H.-N. Lee “Design of Multiplier Less Prototype Filter for Two-channel Filter Bank using Hybrid Method in FCSD Space”, *IET Circuits, Devices & Systems*, (ISI-Cited Publication) (in press) (Impact factor: 0.590, Acknowledgement – None)
83. Zafar Iqbal+, Kiseon Kim, and Heung-No Lee\*, “A cooperative wireless sensor network for indoor industrial monitoring,” *IEEE Transactions on Industrial Informatics*, Vol. 13, No. 2, pp. 482-491, Apr. 2017. (Impact Factor: 4.708, Do-Yak Project)
84. Bandna Bharti, Santosh Kumar, Heung-No Lee\*, and Rajesh Kumar, “Formation of oxygen vacancies and Ti3+ state in TiO2 thin film and enhanced optical properties by air plasma treatment,” Accepted for publication in *Scientific Reports-Nature*, (Impact Factor: 5.228, Do-Yak Project)
85. Zafar Iqbal+ and Heung-No Lee\*, “Spatially concatenated channel-network code for underwater wireless sensor networks,” *IEEE Transactions on Communications*, Vol. 64, No. 9, pp. 3901-3914, Sep. 2016. (Impact Factor: 2.298, Do-Yak Project)
86. Hwanchol Jang+, Saeid Nooshabadi, Kiseon Kim, and Heung-No Lee\*, “Circular Sphere Decoding: A Low Complexity Detection for MIMO Systems with General Two-dimensional Signal Constellations,” *IEEE Trans. on Vehicular Technology*, Vol. 66, No. 3, pp. 2085-2098, Mar. 2017. (Impact Factor: 1.978, Do-Yak)
87. Woong-Bi Lee+, Hwanchol Jang+, Sangjun Park+, Yong Min Song, and Heung-No Lee\*, “COMPU-EYE: a high resolution computational compound eye,” *Optics Express,* Vol. 24, No. 3, pp. 2013-2026, Feb. 8, 2016. (Impact Factor: 3.587; Do-Yak Project)
88. Pawan Kumar, Rajesh Kumar\* and Heung-No Lee\* “Magnetic field induced one-dimensional nano/micro structures growth on the surface of iron oxide thin film,” *Thin Solid Films*, Vol.592, pp.155-161, Oct. 2015. (Impact Factor: 1.759, Do-yak project)
89. Younghak Shin+, Seungchan Lee+, Minkyu Ahn, Hohyun Cho, Sung Chan Jun and Heung-No Lee\* “Simple Adaptive Sparse Representation based Classification Schemes for EEG based Brain-Computer Interface Applications,” *Computers in Biology and Medicine*, Vol.66, pp.29-38, Nov. 2015. (Impact Factor: 1.240, Do-yak project)
90. Younghak Shin+, Seungchan Lee+, Minkyu Ahn, Hohyun Cho, Sung Chan Jun and Heung-No Lee\*, “Noise Robustness Analysis of Sparse Representation based Classification Method for Non-stationary EEG Signal Classification,” *Biomedical Signal Processing and Control*, Vol.21, pp. 8-18, Aug. 2015. (Impact Factor: 1.532; Do-Yak Project)
91. Hwanchol Jang\*, Changhyeong Yoon, Euiheon Chung, Wonshik Choi, and Heung-No Lee\*, “Holistic random encoding for imaging through multimode fibers,” *Optics Express*, Vol. 23, No. 5, March 2015. (Impact Factor: 3.587; Do-Yak Project)
92. Jaewook Kang, Heung-No Lee and Kiseon Kim, “Bayesian Hypothesis Test using Nonparametric Belief Propagation for Noisy Sparse Recovery,” *IEEE Transactions on Signal Processing*, vol. 63, Iss. 4, Jan. 2015 (Impact Factor: 3.198; Do-Yak Project)
93. Pawan Kumar, Nitin Rawat, Da-Ren Hang, Heung-No Lee\* and Rajesh Kumar, “Controlling band gap and refractive index in dopant free α-Fe2O3 films,” Accepted for Publication in *Electron Material Letters*.
94. Pawan Kumar, Heung-No Lee\*, Rajesh Kumar, “Synthesis of phase pure iron oxide polymorphs thin films and their enhanced magnetic properties,” *J Mater Sci: Mater Electron,* (2014) 25:4553–4561.
95. Hwanchol Jang+, Changhyeong Yoon, Euiheon Chung, Wonshik Choi, and Heung-No Lee\*, “Speckle suppression via sparse representation for wide-field imaging through turbid media,” *Optics Express*, Vol. 22, No. 13, pp. 16619–16628, June 2014.
96. 36. Jin-Taek Seong+ and Heung-No Lee\*,“Predicting the Performance of Cooperative Wireless Networking Schemes with Random Network Coding,” *IEEE Transactions on Communications*, vol. 62, no. 8, pp. 2951-2964, Aug. 2014.
97. Richa Khokhra, Nitin Rawat, Partha Barman, Hwan-Chol Jang, Rajesh Kumar, Heung-No Lee\*,” Enhancing the numerical aperture of lenses using ZnO nanostructures-based turbid media,” *Journal of Optics*, Oct. 2013.
98. Jin-Taek Seong+ and Heung-No Lee\*, ”Necessary and Sufficient Conditions for Recovery Performance of Sparse Signals over Finite Fields,”  *IEEE Communications Letters*, vol. 17, no. 10, pp. 1976-1979, Oct. 2013.
99. **Sang-Seon Byun, Ilangko Balasingham, and Heung-No Lee** ”An Inventory Model-based Spectrum Pooling for Wireless Service Provider and Unlicensed Users,” *Computer Communications*, Vol. 36, issues. 10-11, pp. 1186–1191, April 4th, 2013.
100. **Pawan Kumar, Raj Kumar Singh, Nitin Rawat, Partha Bir Barman, Subhash Chander Katyal, Hwanchol Jang+, Heung-No Lee\*, and Rajesh Kumar\*,** “A novel method for controlled synthesis of nanosize hematite (α-Fe2O3) thin film on liquid vapor interface”  *Journal of Nano Particle Research*, March, 2013.
101. **Junil Ahn, Heung-No Lee, Kiseon Kim,”Expected complexity analysis of increasing radii algorithm by considering multiple radius schedules,” *IET Communications*, Vol. 7, Iss. 3, pp. 229-235, Feb, 2013.**
102. **J. Oliver++, WoongBi Lee+, and Heung-No Lee\*, “**Filters with random transmittance for improving resolution in filter array based spectrometers**,”** Optics Express, vol. 21, No. 4, pp. 3969–3989, Feb. 2013.
103. Wooyeol Choi+, Taewoon Kim+, Daeyoung Park+, Heung-No Lee and Hyuk Lim\*, Coordinating Transmit Power and Carrier Phase for Wireless Networks with Multi-Packet Reception Capability, EURASIP Wireless Communications and Networking, 2nd, Jan. 2013.
104. Jin-Taek Seong+ and Heung-No Lee\*, “4-ary Network Coding for Two Nodes in Cooperative Wireless Networks: Exact Outage Probability and Coverage Expansion,” *EURASIP Wireless Communications and Networking*, Accepted.
105. Zafar Iqbal+, Saeid Nooshabadi, and Heung-No Lee\*, "Analysis and Design of Coding and Interleaving in a MIMO-OFDM Communication System," to appear in *IEEE Transactions on Consumer Electronics*, August 2012 Issue.
106. Sang-Seon Byun++, Ilangko Balasingham, Athanasios V. Vasilakos, and Heung-No Lee\*, "Computation of an Equilibrium in Spectrum Markets for Cognitive Radio Networks," to appear *IEEE Transactions on Computers*.
107. Younghak Shin+, Seungchan Lee+, Junho Lee+ and Heung-No Lee\*, "Sparse representation-based classification (SRC) scheme for motor imagery-based brain-computer interface systems," *Journal of Neural Engineering*, no. 9, Aug. 2012.
108. **J. Oliver++,** **WoongBi Lee**+**,** **SangJun Park**+**,** **and Heung-No Lee\***, "Improving resolution of miniature spectrometers by exploiting sparse nature of signals," *Optics Express*, vol. 20, no. 3, pp. 2613-2625, Jan. 2012.
109. H. Kim+, D. Har, Z.-H. Mao, M. Sun, and Heung-No Lee\*, "Efficient Joint Source-Channel Decoding of Multi-State Markov Sequences," ***IET Communications***, vol 6. issue 9, no. 3, pp. 2613-2625, Jan. 2012**.**
110. Cheng-Chung Chang+\*, T.-Y. Kuo, Y.-C. Lo, Heung-No Lee, D. Askey, Zhi-Hong Mao, "User-satisfaction based bandwidth allocation for transmission of multiple sources of human perceptual data," *Journal of the Franklin Institute*, vol. 249, issue 3, pp. 879-890, April 2012.
111. Junil Ahn+, Heung-No Lee, Kiseon Kim\*, “A Near-ML Decoding with Improved Complexity over Wider Ranges of SNR and System Dimension in MIMO Systems,” *IEEE Trans. on Wireless Communications*, vol. 11, issue 1, pp. 33-37, Jan. 2012.
112. **Heung-No Lee\*, Seyoung Chung, Christian Fragouli, and Zhi-Hong Mao,** "Editorial: Special Issue on Network Coding for Wireless Networks," EURASIP *Journal on Wireless Communications and Networking*, 2011.
113. R. Vinjamuri+, M. Sun, C.-C. Chang+, Heung-No Lee, R. J. Sclabassi, and Z.-H. Mao\*. Dimensionality reduction in control and coordination of the human hand. *IEEE Transactions on Biomedical Engineering*, 57(2), pp. 284-295, Feb. 2010.
114. Cheng-Chun Chang+, Zhi-Hong Mao, and Heung-No Lee\*, “Majority Rule Based Iterative Decoding Algorithm for LDGM Codes,” vol. 90, Issue 1, pp. 373-377, *Signal Processing*, Jan. 2010.
115. **R. Vinjamuri**+**, M. Sun, C.C. Chang**+**, Heung-No Lee, R. Sclabassi, and Z.-H. Mao**\*, "Temporal Postural Synergies of the Hand in Rapid Grasping Tasks," IEEE Trans. on Information Technology in Biomedicine, vol. 14, no. 4, pp. 986-994, Jul. 2010.
116. Heung-No Lee\*, J. Zhang+, and C.W. Choi, “General random coding bounds: AWGN channels to MIMO channels,” *Annals of Telecommunication,* vol. 65, issue. 1, pp. 87-99, 2010.
117. Cheng-Chun Chang+ and Heung-No Lee\*, “A Fast Simulation Method for LDGM Codes,” *Journal of the Franklin Institute*, vol. 347, issue. 7, pp. 1368-1373, 2010
118. Mir H. Mahmood+, C.C. Chang+, D. Jung+, Z.H. Mao, H. Lim, and Heung-No Lee\*, “Throughput Behavior of Link Adaptive 802.11 DCF with MUD Capable Access Node,” *AEU* ***International Journal of Electronics and Communications***, vol. 64, pp. 1031-1041, 2010.
119. J. Zhang+ and Heung-No Lee\*, “Energy-Efficient Utility Maximization for Wireless Networks with/without Multipath Routing,” ***International Journal of Electronics and Communications*,** Volume 64, Issue 2, February 2010, Pages 99-111.
120. Z.-H. Mao\*, Heung-No Lee, R. Sclabassi, and M. Sun, “Information Capacity of the Thumb and Index Finger in Communication,” *IEEE Trans. Biomedical Engineering*, Vol. 56, No. 5, pp. 1535-1546, May. 2009.
121. R. Vinjamuri+, D.J. Crammond, D. Kondziolka, Heung-No Lee, and Zhi-Hong Mao\*, “Extraction of Sources of Tremor in Hand Movements of Patients with Movement Disorders,” vol. 13, no.1, pp. 49-56, *IEEE Trans. on Information Technology in Biomedicine*, Jan. 2009.
122. J. Zhang+ and Heung-No Lee\*, “Performance Analyses on LDPC Coded System over Quasi-Static (MIMO) Fading System,” *IEEE Trans. on Communications*, vol. 56, issue 12, pp. 2080-2093, Dec. 2008.
123. X. Song+ and Heung-No Lee\*, “Multimode Precoding for MIMO Systems Performance Bounds and Limited Feedback Codebook Design,” *IEEE Trans. on Signal Processing*, vol. 56, no. 10, pp. 5296-5301, Oct. 2008.
124. J. Zhang+ and Heung-No Lee\*, “Throughput Enhancement with a Modified 802.11 MAC Protocol with Multi-User Detection Support,” *International Journal of Electronics and Communications*, vol. 62, issue 5, pp. 365-373, May, 2008.
125. C.C. Chang+ and Heung-No Lee\*, “On the Estimation of Target Spectrum for Filter-Array Based Spectrometers,” *Optics Express*, vol. 16, no. 2, pp. 1056-61, Jan. 2008.
126. J. Wu+ and Heung-No Lee\*, “Performance Analysis for LDPC Coded Modulation in MIMO Multi-Access Systems,” *IEEE Trans. on Communications*, vol. 55, no. 7, pp.1417-1426, July, 2007.
127. J. Zhang+ and Heung-No Lee\*, “Performance Analysis of LDPC-Coded Space-Time Modulation over MIMO Fading Channels,” *IEEE Communications Letters*, vol. 11, Issue 3, pp. 234 – 236, March 2007.
128. J. Zhang+ and Heung-No Lee\*, “A Performance Bound on Random-Coded MIMO Systems,” *IEEE Communications Letters*, vol.10, no.3, pp.168-170, March, 2006.
129. J. Zhang+ and Heung-No Lee\*, "Union Bounds on LDPC Coded Modulation Systems over Fast Fading MIMO Channels," vol. 9, no.9, pp. 796-798, *IEEE Communications Letters,* Sept.2005*.*
130. Heung-No Lee\* and X. Hu+, "Robust Iterative Tree-Pruning Detection and LDPCC Decoding," *IEEE Journal of Selected Areas on Communications,* vol. 23, no.5, pp. 1013-1025, May 2005.
131. Heung-No Lee\* and G. J. Pottie, "Fast Adaptive Equalization/Diversity Combining for Time Varying Dispersive Channels", *IEEE Transactions on Communications*, vol. 46, no. 9, pp. 1146-1162, Sept. 1998.

Refereed International Conference/Workshop Presentations

1. **Seungmin Kim+, Gyeongdeok Maeng+ and Heung-No. Lee\*, “Smart Contract-Based Checkpoint for Initial PoW Network Security,” 2023 Fourteenth International Conference on Ubiquitous and Future Networks (ICUFN), Paris, France, 2023, pp. 88-93.**
2. **Jioh Lee+, Cheolsun Kim+, Young-in Choi+, and Heung-No Lee, “Image reconstruction for the artificial compound eye based on deep learning”, SPIE Photonics West 2023, San Francisco, USA, Jan 28 – Feb. 2, 2023. (Do-Yak Project)**
3. **Heung-No Lee\*, Jongbaek Park, W.H. Cheong, Byungtae Lee, Kibae Kim\*, “Challenges and Solutions to Reimagining the Regulations for Blockchain (2021),” ICIS 2021 Proceedings. 1.**
4. **Mohamed Yaseen.J+, Giljun Jung+ and Heung-No Lee\*. “Decentralized Framework for Medical Images Based on Blockchain and Inter Planetary File System”, The 41st Annual International Conference of the IEEE Engineering in Medicine and Biology Society(EMBC 2019), Berlin, Germany, Jul. 23-27, 2019. (Do-Yak Project)**
5. **Cheolsun Kim+, Dongju Park, and Heung-No Lee**\***, “Convolutional neural networks for the reconstruction of spectra in compressive sensing spectrometers”, SPIE Photonics West 2019, San Francisco, USA, Feb. 2-9, 2019. (Do-Yak Project)**
6. **Seungchan Lee+, and Heung-No Lee**\***, “Design of Portable Functional Near-Infrared Spectroscopy-based Brain Monitoring System”, International Conference on Electronics, Information, and Communication (ICEIC) 2019, Auckland, New Zealand, Jan. 22-25, 2019. (Do-Yak Project)**
7. **Zafar Iqbal+, Saeid Nooshabadi, and Heung-No Lee**\***, “Locating and Disregarding the Information from Compromised Sensors in a WSN”, The 9th IEEE Annual Ubiquitous Computing, Electronics & Mobile Communication Conference (IEEE UEMCON 2018), New York, USA, Nov. 8-10, 2018.**
8. **Seungchan Lee+, Anil Kumar, and Heung-No Lee**\***, “Development of a 16bit 8-channel functional near-infrared spectroscopy based neuroimaging system”, The 40th Annual International Conference of the IEEE Engineering in Medicine and Biology Society(EMBC 2018), Honolulu, USA, Jul. 17-21, 2018. (Brain Research Program)**
9. **Hyunjun Han+, Jusung Kang+, Muhammad Asif Raza and Heung-No Lee**\***, “Learning Through Adverse Event for Collision Avoidance: A Self-Learning Approach”, The 10th International Conference on Ubiquitous and Future Networks(ICUFN 2018), Prague, Czech Republic, Jul. 3-6, 2018. (UAVs projects)**
10. **H. Singh, A. Kumar, L. K. Balyan, H. N. Lee**\***, “Piecewise Gamma Corrected Optimally Framed Grumwald-Letnikov Fractional Differential Masking for Satellite Image Enhancement”, IEEE International Conference on Communication and Signal Processing(ICCSP), Melmaruvathur, Tamilnadu, India, Apr. 3-5, 2018. (No acknowledgment)**
11. **P. S. Reddy, H. Singh, A. Kumar, L. K. Balyan, H.-N. Lee**\***, “Retinal Fundus Image Enhancement using Piecewise Gamma Corrected Dominant Orientation based istogram Equalization” IEEE International Conference on Communication and Signal Processing(ICCSP), Melmaruvathur, Tamilnadu, India, Apr. 3-5, 2018. (No acknowledgment)**
12. **Mohamed Yaseen.J+ and Heung-No Lee**\***.“Evaluating the Effect of Various Speckle Reduction Filters on Ultrasound Liver Cancer Images”, 17th Int. Conf. on Electron. Inf. and Commun. (ICEIC 2018), Hawaii, USA, Jan. 24-27, 2018. (Do-Yak Project)**
13. **Seungchan Lee+, Anil Kumar, Younghak Shin+, and Heung-No Lee**\***, “An improved design of EEG monitoring system with dry electrodes” , The 39th Annual International Conference of the IEEE Engineering in Medicine and Biology Society(EMBC 2017), Jeju Island, South Korea, July 11-15 2017, (Brain Research Program)**
14. **Ni Pavel+, Heung-No Lee**\***, “Ultrasound Image Reconstruction using Compressive Sensing” , The 39th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Jeju-do South Korea, July 11-15 2017, (Do-Yak) poster.**
15. **Jeong Park+, Jehyuk Jang+, and Heung-No Lee\* “A Calibration for the Modulated Wideband Converter Using Sinusoids with Unknwon Phases,” *9th Int. Conf. on Ubiquitos and Future Network (ICUFN 2017)*, Milan, Italy, July. 4-July.7, 2017. (Accepted at April. 27. 2017, Do-Yak Project, Thales Project)**
16. **Zafar Iqbal+ and Heung-No Lee\*, “Low-latency and high-reliability cooperative WSN for indoor industrial monitoring,” *IEEE 85th Vehicular Tech. Conf.* (*VTC-Spring*), Sydney, Australia, Jun. 4-7, 2017. (Do-Yak Project)**
17. **Utpreksh Patbhaje, Ranjeet Kumar, A. Kumar\*, Heung-No Lee\*, “Compression of Medical Image using Wavelet based Sparsification and Coding”, IEEE Int. Conf. SPIN 2017, 2-3 Feb. 2017, Noida, India.**
18. **Cheolsun Kim+, Woong-Bi Lee+, Gun Wu Ju++, Jeonghoon Cho, Seongmin Kim, Jinkyung Oh, Dongsung Lim, Yong Tak Lee, and Heung-No Lee\* “A method of incident angle estimation for high resolution spectral recovery in filter-array-based spectrometers,” *Proc. SPIE* 10117, San Francisco, US, Jan. 27-Feb.1, 2017. (Do-Yak Project)**
19. **Zafar Iqbal+ and Heung-No Lee\*, “Dual-hop cooperation protocol for spectrum sensing in cognitive radio networks,” 16th Int. Conf. on Electron. Inf. and Commun. (ICEIC 2017), pp. 409-410, Phuket, Thailand, Jan. 11-14, 2017.**
20. **Mohamed Yaseen.J+ and Heung-No Lee\*. ”Compressive Sensing Based Secure Storage and Transmission of Ultrasound Images.”16th Int. Conf. on Electron. Inf. and Commun. (ICEIC 2017), Phuket, Thailand, Jan. 11-14, 2017. (Do-Yak Project)**
21. **Jehyuk Jang+, Nam Yul Yu, and Heung-No Lee\*, “A Study on Mixing Sequences in Modulated Wideband Converters”, 2016 IEEE Conference on Signal and Information Processing (Global SIP), Washington DC, USA, December 7-9, 2016.**
22. **I . Sharma, A. Kumar\* and G. K. Singh, H.-N. Lee\***, “Design of Multiplierless Cosine Modulated Filterbank using Hybrid Technique in Sub-Expression Space”, 21th IEEE International Conference on Digital Signal Processing (DSP), Beijing, China, October16-18, 2016.
23. **H. Singh, A. Kumar\*, G. K. Singh, H.-N. Lee\***, “A novel gamma correction approach using optimally clipped sub-equalization for dark image enhancement ” 21th IEEE International Conference on Digital Signal Processing (DSP), Beijing, China, October16-18, 2016.
24. **N. Agrawal, A. Kumar\*, V. Bajaj, and H.-N. Lee\***, “Controlled Ripple Based Design of Digital IIR Filter”, 21th IEEE International Conference on Digital Signal Processing (DSP), Beijing, China, October16-18, 2016.
25. **Zafar Iqbal+ and Heung-No Lee\***, “A self-organizing wireless sensor network for industrial monitoring,” 31st Int. Conf. on Circuits/Systems, Computers, and Communications (ITC-CSCC 2016), Okinawa, Japan, pp. 351-354, Jul. 10-13, 2016.
26. **Woong-Bi Lee+, Cheolsun Kim+, Gun Wu Ju+, Yong Tak Lee, and Heung-No Lee\***, “Design of thin-film filters for resolution improvements in filter-array based spectrometers using DSP”, SPIE Defense + Commercial Sensing 2016, Baltimore, USA, Apr. 17-21, 2016.
27. **Seungchan Lee+, Younghak Shin+  and Heung-No Lee\***, “Design of Active Dry Electrodes and its Evaluation for EEG acquisition”, International Conference on ICT Convergence 2015 (ICTC 2015), Jeju, Korea, Oct. 28-30, 2015.
28. **Zafar Iqbal+ and Heung-No Lee\***, “Deployment Strategy Analysis for Underwater Cooperative Wireless Sensor Networks,” International Conference on ICT Convergence, pp. 699-703, Jeju, Korea, Oct. 28-30, 2015.
29. **Younghak Shin+, Seungchan Lee+  and Heung-No Lee\***, “Dictionary Update based Adaptive EEG Classification for Real Time Brain-Computer Interface Applications”, International Conference on ICT Convergence 2015, Jeju island, Korea, Oct. 28-30, 2015.
30. **Zafar Iqbal+ and Heung-No Lee\***, “Underwater Acoustic Channel Model and Variations due to Changes in Node and Buoy Positions,” 5th Pacific Rim Underwater Acoustics Conference, ASA POMA vol. 24 070001, Vladivostok, Russia, Sep. 23-26, 2015.(Do-Yak Project)
31. **Younghak Shin+, Seungchan Lee+,  and Heung-No Lee\***, “Evaluation of Sparce Representation based Classification method for Online Brain – Computer Interface Systems”, 37th Annual Internatioinal Conference of the IEEE Engineering in Medicine and Biology Society, Milan, Italy, August 24-29, 2015.
32. **Pavel S. Ni+, Sangjun Park+, and Heung-No Lee\*,** “Design of Unfocused Ultrasound Imaging System using Compressive Sensing”, 37th Annual Internatioinal Conference of the IEEE Engineering in Medicine and Biology Society, Milan, Italy, August 24-29, 2015. Poster.
33. **Seungchan Lee+, Younghak Shin+ and Heung-No Lee\*, “Design of Active Dry Electrodes for EEG based BCI systems”, 6th International Brain-Computer Interface Conference, Graz University of Technology, Austria, September 16-19, 2014.**
34. **Jaewook Kang, Heung-No Lee, and Kiseon Kim, “Noisy Behavior of MAP-based Sparse Support Detection”, SPARS 2013, Lausanne in Switzerland, July 8-11, 2013, (Do-Yak, Haek-Sim Project)**
35. **J. Oliver, WoongBi Lee+ and Heung-No Lee**\***, “Random Transmittance Based Filter Array Spectrometers: Sparse Spectrum Recovery And Resolution Improvement”, IEEE Global Conference on Signal and Information Processing (GlobalSIP), Austin, Texas, U.S.A, December 3-5, 2013, (Do Yak Project)**
36. **Asad Mahmood, Jaewook and Heung-No Lee**\***, “Sparse or Dense-Message Passing (MP) or Approximate Message Passing (AMP) for Compressde Sensing Signal Recovery”, 2013 IEEE Pacific Rim Conference on Communications, Computers and Signal Processing, University of Victoria, Victoria, B.C., Canada, Aug 27~29, 2013, (Do Yak Project)**
37. **Jin-Taek Seong+ and Heung-No Lee**\***, ”Exact Outage Probability of Two Nodes for Cooperative Networking using GF(4)”, 14th IEEE International Workshop Signal Processing Advances in Wireless Communications, Darmstadt, Germany, June 16~19, 2013, (Hae-Sim, MT-IT Project), Poster**
38. **Seungchan Lee+, Younghak Shin+, Soogil Woo+, Kiseon Kim and Heung-No Lee**\***, ”Design of Dry Electrode for Wireless BCI systems”, 35th IEEE EMBC 2013, SaD02.25, Osaka, Japan, July 3~7, 2013, (Do-Yak Project), Poster**
39. **Woong-Bi Lee+, J. Oliver, Seung-Chul Kim, and Heung-No Lee**\***, ”Random optical scatter filters for spectrometers: Implementation and Estimation”, Optics and photonics congresses: Applied Industrial Optics – Spectroscopy, Imaging, & Metrology, Arlington, Virginia, USA, June 23-27, 2013, (Do-Yak Project)**
40. **Seungchan Lee+, Younghak Shin+, Soogil Woo, Kiseon Kim and Heung-No Lee**\***, ”Design of Dry Electrode for EEG based BCI systems”, 5th International BCI Meeting, Article ID: 91, Asilomar Conference Grounds, Monterey, USA, June 3~7, 2013, (Do-Yak Project)**
41. **Younghak Shin+, Seungchan Lee+, Soogil Woo+ and Heung-No Lee**\***,** “Performance Increase by using a EEG Sparse Representation based Classification Method”, 2013 IEEE ICCE, pp. 201~203 Las Vegas, USA, Jan 11~14, 2013.
42. Sangjun Park**+** and Heung-No Lee\*, “Number of Compressed Measurements Needed for Noisy Distributed Compressed Sensing”, 2012 IEEE International Symposium on Information Theory Proceedings, pp. 1653 – 1656, Boston, USA, 2012.
43. Jaewook Kang, Heung-No Lee and Kiseon Kim, “Bayesian Hypothesis Test for Sparse Support Recovery using Belief Propagation”, IEEE Statistical Signal Processing Workshop 2012, pp45~48 Ann Arbor, USA, Aug 5~8, 2012.
44. Zafar Iqbal**+**, Saeid Nooshabadi, and Heung-No Lee\*, “Efficient Interleaver Design for MIMO-OFDM Based Communication Systems on FPGA“ , 2012 IEEE 16th International Symposium on Consumer Electronics (2012 ISCE), pp. 1-5, Harrisburg, PA, USA, June 2012.
45. Hyeong-Won Jeon, Jeong-Min Ryu**+** and Heung-No Lee\*, “Fast multiplath generation method for underwater acoustic communications networking system simulation”, 2012 International Conference on Electronics, Information and Communication(ICEIC2012), pp. 247 – 248, Jeongseon, Korea, Feb. 1 – 3, 2012.
46. Sangjun Park**+** and Heung-No Lee\*, "On the Derivation of RIP for Random Gaussian Matrices and Binary Sparse Signals," International Conference on ICT Convergence, Seoul, Korea, September 28 ~ 30, 2011.
47. Hyeong-Won Jeon, Su-Je Lee and Heung-No Lee\*, "LDPC Coded OFDM System Design and Performance Verification on a Realistic Underwater Acoustic Channel Model", The 30th anniversary of the premier international conference for military communications(MILCOM 2011), Baltimore, USA, Nov. 7 - 10, 2011.
48. Hyeong-Won Jeon, Su-Je Lee and Heung-No Lee\*, "Performance Verification of LDPC coded OFDM System in Underwater Acoustic", The 26th International Technical Conference on Circuits/Systems (ITC-CSCC2011), Gyeongju, Korea, Jun. 19 - 22, 2011.
49. Sangjun Park**+**, Hwanchol Jang**+** and Heung-No Lee\*, "Study on Performance Behavior of the Compressive Sensing Measurements for Multiple Sensor System", 45th *Asilomar Conference on Signals, Systems and Computers*, Asilomar, Asilomar Hotel & Conference Grounds Pacific Grove, CA, Nov 07-10, 2011.
50. Hwanchol Jang**+**, Saeid Nooshabadi and Heung-No Lee\*, "Predicting the Pruning Potential on the Sphere Decoding for Multiple-Input Multiple-Output Detection", 45th *Asilomar Conference on Signals, Systems and Computers*, Asilomar, Asilomar Hotel & Conference Grounds Pacific Grove, CA, Nov 07-10, 2011.
51. Younghak Shin**+**, Seungchan Lee**+**, Minkyu Ahn, Sung Chan Jun and Heung-No Lee\*, " A New BCI Classification Method based on EEG Sparse Representation," 5th International Conference Brain Computer Interface 2011, Graz, Austria, September 22-24, 2011.
52. Hwanchol Jang**+**, Saeid Nooshabadi, Sangjun Park**+** and Heung-No Lee\*, "Sorted Orthotope Sphere Decoding for MIMO Detection," The 5th Joint Conference on Information and Communication Technology & the 1st YEllow Sea International Conference on ubiquitous Computing (JCITCT & YES-ICuC), Shandong University at Weihai, China, Aug 17-20, 2011.
53. Younghak Shin**+**, Seungchan Lee+ and Heung-No Lee\*, "A New BCI Classification Method based on EEG Sparse Representation", *Signal Processing with Adaptive Sparse Structured Representation*, Edinburgh, Scotland, June 27-30, 2011.
54. J. Oliver and Heung-No Lee\*, "A Realistic Distributed Compressed Sensing Framework for multiple Wireless Sensor Networks", *Signal Processing with Adaptive Sparse Structured Representation*, Edinburgh, Scotland, June 27-30, 2011.
55. Sangjun Park**+**, Hwanchol Jang**+** and Heung-No Lee\*, "Performance Limtis of the Measurements on Compressive Sensing for Multiple Sensor System", *Signal Processing with Adaptive Sparse Structured Representation*, Edinburgh, Scotland, June 27-30, 2011.
56. J. Kang**+**, Heung-No Lee, K. Kim, “Message Passing Aided Least Square Recovery for Compressed Sensing,” *Signal Processing with Adaptive Sparse Structured Representation*, Edinburgh, Scotland, June 27-30, 2011.
57. Younghak Shin**+**, Seungchan Lee**+**,Minkyu Ahn**+**, Sung Chan Jun**+** and Heung-No Lee\*, "Motor Imagery based BCI Classification via Sparse Representation of EEG Signals," *8th International Symposium on Noninvasive Functional Source Imaging of the Brain and Heart and the 8th International Conference on Bioelectromagnetism*, Banff, Canada, May 13-16, 2011.
58. Jin-Taek Seong**+**, Heung-No Lee\*, "Concatenation of LDPC codes with Golden Space-Time Block Codes over the Block Fading MIMO Channels: System Design and Performance Analysis," *45th Annual Conference on Information Science and Systems*, Johns Hopkins Univ., Mar. 23-25, 2011.
59. **J.I. Ahn, Heung-No Lee, K.-S. Kim, “Intelligent Implementation of Schnorr-Euchnor Sphere Decoding for MIMO Systems,” ITC-CSCC, pp. 700-701, 2010.**
60. **Sangjun Park+, Junho Lee+ and Heung-No Lee\*,** "Per-Sensor Measurements Behavior of Compressive Sensing System for Multiple Measurements ," 44th Annual Asilomar Conference on Signals, Systems and Computers, Asilomar, Asilomar Hotel & Conference Grounds, Pacific Grove, CA, Nov 07-10, 2010.
61. **Hwanchol Jang+, Heung-No Lee and Nooshabadi, S,** "Reduced-complexity orthotope sphere decoding for multiple-input multiple-output antenna system," IEEE International Midwest Symposium on Circuits and Systems (MWSCAS), Seattle, Washington, USA, Aug 01-04, 2010.
62. **Wooyeol Choi, Taewoon Kim, Heung-No Lee and Hyuk Lim,** "Carrier phase adjustment for multiple access communication systems with multi-packet reception capability," IEEE Wireless Communications and Networking Conference (WCNC 2010), Sydney, Australia, April 18-21, 2010.
63. Wooyeol Choi, Daewon Jung, Heung-No Lee, and Hyuk Lim, "Power control for multiple access communication systems with multi-packet reception capability," IEEE Conference on Local Computer Networks (LCN 2009), pp. 281-284, Zurich, Switzerland. October 20-23, 2009.
64. J. Ahn, H. Lee and K. Kim, "Schnorr-Euchner Sphere Decoder with Statistical Pruning for MIMO Systems," ISWCS 2009,pp. 619-623, 7. Sept. 2009.
65. Ahn, H. Lee and K. Kim, "Ordering Aided Schnorr-Euchner Sphere Decoding with Statistical Pruning based on IRA for MIMO Systems," APCC 2009, pp. 16-19, 8. Oct. 2009.
66. **C.C. Chang and Heung-No Lee**\***, “Coding perspective wireless multiple access relay networks,” IEEE School of Information Theory workshop, University Park Campus, Penn State University, June 1-5, 2008. CD Proceeding Only.**
67. **C.C. Chang and Heung-No Lee**\***,** “Attack Resilient Network Channel Code for the Wireless Multiple Access Relay Network,” *IEEE Milcom.* 2007, pp. 1-7, Oct. 29-31, 2007. Orlando, Florida.
68. **C.C. Chang and Heung-No Lee**\***, “**Performance Analysis of Regular Low-Density Generator-Matrix Codes under Majority-Rule Based Iterative Decoding Algorithm,” *IEEE Globecom* 2007, pp.3894-3898, Washington D.C., Nov. 26-30, 2007.
69. **Heung-No Lee and J. Zhang, “Random Coding Bounds for LDPC coded modulation for MIMO Multiple Access channels,” *Proc. of* *Wireless Networking Symposium of International Conference on Global Challenge in Science and Technology*, Aug. 8-11, 2007, Washington D.C. Organized by KSEA. CD Proceedings Only.**
70. Ning Yao, Heung-No Lee, Cheng-Chun Chang, Robert Sclabassi, Mingui Sun, “A Power-efficient Communication System between Brain-Implantable Devices and External Computers,” *Proc. of 29th* *IEEE EMBS Annual International Conference*, Lyon, France, pp. 6588-6591, from 23rd - 26th August, 2007. CD Proceedings.
71. **C.C. Chang and Heung-No Lee**\***, “Space-time mesh codes for multiple access relay networks: space vs. time diversity benefits,” *Proc. of Information Theory and Applications Workshop, 2007: the 3rd Workshop on Network coding, theory, and applications*, pp.79-83, University of California, San Diego, CA, Jan. 29th, 2007. (The proceeding is available at** <http://www.ieeexplore.ieee.org/>**.)**
72. Ning Yao, Heung-No Lee, R.J. Sclabassi, and Mingui Sun, “Low Power Digital Communication in Implantable Devices Using Volume Conduction of Biological Tissues,” *Proc. of* ***IEEE 2006 International Conference of the Engineering in Medicine and Biology Society*,** pp. 6249 – 6252**, Aug.30 - Sept 3, 2006, New York, NY, USA.**
73. J. Zhang and Heung-No Lee\*, “Random Coding Union Bounds and Error Exponents for Concatenated MIMO Systems,” *Proc. of IEEE International Conference on Communications* 2006, pp. 4248 – 4252, June 11-15, 2006, Istanbul, Turkey.
74. J. Zhang and Heung-No Lee\*, “Combinatorial Union-Bound Analysis on the Concatenation of LDPC/Turbo Codes and Space-Time Codes over Fast Fading MIMO Channels,” *Proc. of* *IEEE International Conference on Communications* 2006, pp. 4870-4875, 11-15 June 2006, Istanbul, Turkey.
75. Heung-No Lee and J. Zhang, “Random Coding Bounds on Concatenated Space-Time Transmission over MIMO Multiple Access Systems,” *Proc. of 4th* *International Symposium on Turbo Codes & Related Topics*, no. 136 (6pages), Munich, Germany, April 3-7, 2006. (The proceeding is available at <http://www-turbo.enst-bretagne.fr/>.)
76. J. Zhang and Heung-No Lee\*, “Union Bounds to Error Probabilities of LDPC-Coded Q-ary Modulation Systems over Fast Fading MIMO Channels,” *Proc. of* *IEEE Wireless Communications and Networking Conference* 2006,” pp. 1212-1216, Las Vegas, Nevada, USA, April 3-6, 2006.
77. J. Zhang and Heung-No Lee\*, “Random Coding Union Bounds and Constrained Capacity for LDPC Code Based MIMO Systems,” *Proc. of*  *IEEE* 63rd *Vehicular Technology Conference* (VTC) *Spring* 2006, Melbourne, Australia, pp. 2408 – 2412, May 7-10, 2006.
78. J. Zhang and Heung-No Lee\*, "Performance Analysis on Coded System over Quasi-Static (MIMO) Fading Channels," *Proc. of IEEE International Conference on Communications 2005*, vol. 2,  pp. 800 – 804, Seoul, Korea, May 16-20, 2005.
79. J. Yin, Heung-No Lee, Bo Ryu and A. Mohin, “Iterative MMSE-Sphere List Detection and Graph Decoding MIMO OFDM Transceiver,” *Proc. of IEEE Vehicular Tech. Conference, Spring 2004,* pp. 903-.8, Milan, Italy, May.17-19, 2004.
80. J. Wu and Heung-No Lee, “Best Mapping for LDPC coded Modulation on SISO, MIMO and MAC channels,” *Proc. of IEEE Wireless Communications and Networking Conference* 2004*,* Volume: 4 , 21-25*,* pp. 2428 - 2431, March 21-25, 2004. Atlanta, Georgia USA.
81. Heung-No Lee, “LDPC coded modulation MIMO OFDM Transceiver: Performance Comparison with MAP Equalization,” *Proc. of IEEE Vehicular Tech. Conference 2003,* vol.2, pp. 1178-81, Jeju, Korea, April 22-25, 2003.
82. X. Hu and Heung-No Lee, “Soft-input soft-output tree-search equalization for MIMO ISI fading channels,” *Proc. of the 13th MPRG Symposium on Wireless Personal Communications*, pp. 27-32, Virginia Tech, Blacksburg, VA, June 4-6, 2003. (The proceeding is available at <http://www.mprg.org/>.)
83. J. Wu and Heung-No Lee, “Study of optimal mapping rule for LDPC codes under iterative demapping and graph decoding,” *Proc. of the 13th MPRG Symposium on Wireless Personal Communications*, pp. 216-223, Virginia Tech, Blacksburg, VA, June 4-6, 2003. (The proceeding is available at <http://www.mprg.org/>.)
84. V. Gulati and Heung-No Lee, “Low-complexity iterative per-antenna MAP equalizer for MIMO frequency selective fading channels,” *Proc. of* *IEEE Globecom*, vol. 2, pp. 1118-1123, Nov. 17-21, 2002, Taipei, Taiwan, ROC.
85. Heung-No Lee and V. Gulati, “Iterative equalization/decoding of LDPC code transmitted over MIMO ISI fading channels,” *Proc. of* *IEEE International Symposium on Personal, Indoor and Mobile Radio Communication*, pp. 1330-1336, Lisbon, Portugal, Sept.15-18, 2002.
86. W. Yuen, Heung-No Lee and T. Anderson, “A Simple but effective cross-layer networking system for mobile ad hoc networks,” *Proc. of* *IEEE International Symposium on Personal, Indoor and Mobile Radio Communication*, pp. 1952-6, Lisbon, Portugal, Sept. 15-18, 2002.
87. Heung-No Lee, “Impact of Flow Control Windows in TCP on Fractal Scaling of Internet Traffic,” *Proc. of IEEE Globecom*, pp. 1723-1733, San Antonio, Texas, Nov. 25-29, 2001.
88. Heung-No Lee and G.J. Pottie, “Matched filter bounds on q-ary QAM symbol error probability for diversity receptions and multipath fading ISI channels,” *Proc. of IEEE International Symposium on Personal, Indoor and Mobile Radio Communication*, pp. 577-583, London, UK, Sept. 18-21, 2000.
89. Y. Choi, Heung-No Lee and A. Garg, “Measurement and analyses of wide area network traffic,” *Proc. of Symposium on performance evaluation of computer and telecommunication systems*, pp. 308-316, Vancouver, CANADA, July 16-20, 2000. Organized by The Society for Modeling and Simulation International.
90. Heung-No Lee and G.J. Pottie, “Adaptive sequence detection using T-algorithm on multipath fading ISI channels,” *Prof. of IEEE International Conf. on Communications (Communication Theory Track)*, pp. 125-129, Vancouver, CANADA, June 6-10, 1999.
91. Heung-No Lee and G.J. Pottie, “Adaptive sequence detection of channel-interleaved trellis-coded modulation over multipath fading ISI channels,” *IEEE Vehicular Technology Conference*, vol. 2, pp. 1474~79, Houston, Texas, USA, May 16-19, 1999.
92. Heung-No Lee and G.J. Pottie, “Channel estimation based adaptive equalization/ diversity combining for time-varying dispersive channels,” *Proc. of* *IEEE Vehicular Technology Conference*, pp. 884-8, Phoenix, AZ, May 5-7, 1997.

# Patent Applications

U.S. Patent Applications Filed/Registered

1. 2. Jehyuk Jang, Heung-No Lee, "Universal zero-knowledge succinct non-interactive argument of knowledge proof system for stack-based virtual machine program," US 18,070,497 A1, filing date: Aug. 8th,2023.
2. Jehyuk Jang, Heung-No Lee, "Transaction verification system for blockchain, and transaction verification method for blockchain," US 17,611,506 A1, filing date: July 7th, 2022.
3. Jehyuk Jang, Heung-No Lee, "Blockchain e-voting system and operating method thereof," US 17,517,563 A1, filing date: May 5th, 2022.
4. Heung-No Lee, Woong Bi Lee, Hwanchol Jang, “Imaging device using plurality of lenses”, US 10,605,962 B2, registration date: Mar. 31th, 2020.
5. Heung-No Lee, J. Oliver, Woong Bi Lee, “Spectrometry apparatus and spectrometry method”, registration number: US 10,458,843 B2, registration date: Oct. 29th, 2019
6. Heung-No Lee, Hwanchol Jang, “MICROSCOPE”, registration number: US 10,082,659 B2, registration date: Sep. 25th, 2018
7. Heung-No Lee, Hwanchol Jang, “CROSS REFERENCE TO RELATED APPLICATION”, registration number: US 10,080,485 B2, registration date: Sep. 25th, 2018
8. Heung-No Lee, Jaewook Kang, Kiseon Kim, “Method and apparatus for sparse signal transmission, method and apparatus for sparse signal recovery”, registration number: 9734128 B2, registered date: Aug. 15th, 2017
9. Heung-No Lee, Jaewook Kang, Kiseon Kim, “Method and apparatus for transmitting sparse signal, and method and apparatus for recovering sparse signal via belief propagation and bayesian hypothesis test”, registration number: US 9160398B2, registered date: Oct. 13th, 2015
10. Heung-No Lee, Sangjun Park, J. Oliver, Woongbi Lee, “Method and Apparatus for Processing Optical Signal Of Spectrometer Using Sparse Nature of Signals”, registration number: US 9,030,662, registered date: May. 12th, 2015
11. Heung-No Lee, Hwanchol Jang, “Orthotope Sphere Decoding method and apparatus for signal reconstruction in multi-input multi-output antenna system”, registration number: US 8,983,006 B2, registered date: Mar. 17th, 2015.
12. Heung-No Lee, Hwanchol Jang, “Orthotope Sphere Decoding method and apparatus for signal reconstruction in multi-input multi-output antenna system”, registration number: US 8,798,209 B2, registered date: Aug. 5th, 2014
13. Heung-No Lee, Junho Lee, Sangjun Park, “Signal Acquisition and Method for Distributed Compressive Sensing and Joint Signal Recovery”, registration number: 8391800, registered date: Mar. 5th, 2013.
14. Heung-No Lee and Jingqiao Zhang, “NETwork channel coding and iterative Multi-User Detection (NETMUD) systems for multiple access channels,” Submitted as a patent disclosure to University of Pittsburgh technology office, April. 2nd, 2004.
15. Heung-No Lee and V. Gulati, “Method and Apparatus for Iterative Equalization/Decoding MIMO Transmission Over MIMO Channels Utilizing a Per-Antenna Equalization Architecture, Attorney Docket No. 1044-409-01, application date: Dec. 28th, 2001.
16. Heung-No Lee and V. Gulati, “Method and Apparatus for Iterative Equalization/Coding MIMO Transceiver, Attorney Docket No. 1044-410-01, application date: Dec. 28th, 2001.

PCT Patent Applications Filed/Registered

1. Heung-No Lee, Jin-Taek Seong, “유한체의 희소신호 복구방법, 유한체의 희소신호 복구장치, 및 이 방법을 기록되는 기록매체”, registration number: 5914755, registered date: Apr. 8th, 2016.
2. Heung-No Lee, J. Oliver, Woongbi Lee, “분광장치 및 분광방법 (Apparatus for Improving Spectral Resolution using Random Transmittancs in OPtica lSpectrometers”, , registration number: 6290905, registered date: Feb. 16th, 2018.
3. Heung-No Lee, Younghak Shin, Seungchan Lee, “Brain-Computer Interface System, and Classification”, application number: PCT/KR2012/003572, application date: May 7th, 2012.

Korean Patents Filed/Registered

1. 장재혁, 이흥노, “스택 머신 프로그램을 위한 범용 영 지식 스나크 증명 시스템 및 방법”, Registration number: 10-2662756, Apr. 26th, 2024.
2. 최해웅,이흥노,강주성,김수민, “암호화폐 거래장치 및 암호화폐 거래장치의 운용방법”, Application number: 2024-0045254, Apr, 3rd , 2024.
3. 장재혁, 이흥노, “블록체인 전자투표시스템, 그 시스템의 운용방법 (Bolckchain e-voting system and manipulation method)”, Registration number: 10-2430835, Aug. 4th, 2022.
4. 박진태, 이창윤, 강주성, 이흥노, “다중 레이블 아웃라이어 검출 방법 및 신호 송출원 식별 모델 확장 방법”, Registration number: 10-2415975, Registration date: June 28th, 2022.
5. 박진태, 강주성, 이흥노, “앙상블 기반 무선 핑거프린팅 장치 및 이를 이용한 송출원 식별 방법 “, Registration number: 10-2347174, Registration date: December 30th, 2021.
6. 장재혁, 이흥노, “블록체인의 거래검증시스템, 및 블록체인의 거래검증방법,” Registration number: 10-2288776, Date: October 5th, 2021.
7. 이흥노, “부호-암호 화폐 시스템” , Application number: 2019-0151246, Nov. 22th, 2019.
8. 이흥노, 이웅비, 김철순, 이수경, 이용탁, 주건우, “분광장치 및 분광방법”, registration number: 10-2030735, registration date: Oct. 2nd, 2019.
9. 장재혁, 이흥노, “블록체인의 거래검증시스템, 및 블록체인이 거래검증방법”, Application number: 2019-0120655, Sep. 30th, 2019.
10. 이흥노, “Scalable DeSecure ECCPoW Blockchains 난이도 조절 Algorithm”, Application number: 2019-0099153, Aug. 13th, 2019.
11. 이흥노, “블록체인거버넌스”, Application number: 2019-0084800, Jul. 12th, 2019.
12. 김철순, 이웅비, 이흥노, “하이퍼스펙트럼 이미지 장치”, registration number: 10-1986998, registration date: June 3rd, 2019.
13. 장재혁, 이흥노, “블럭체인의 거래 컨펌횟수결정시스템”, Application number: 2019-0061493, May 24th, 2019.
14. 공득조, 이웅비, 이동선, 이흥노, 송영민, “물리적 복제방지 장치 및 이를 이용한 난수 생성 방법”, registration number: 10-1975106, registration date: Apr. 26th, 2019.
15. 이용우, 신영학, 이승찬, 이흥노, “BCI 시스템에 사용되는 스마트 키보드 및 이의 입력 방법”, registration number: 10-1959049, registration date: Mar. 11th, 2019.
16. 장환철, 이흥노, “다중 안테나 시스템의 신호 복구를 위한 초월 평면 스피어 디코딩 방법 및 이를 위한 장치”, registration number: 10-1959039, registration date: Mar. 11th, 2019.
17. 이흥노, 박상준, 최해웅, 이웅비, “부호-암호 화폐 시스템”, Application number: 2018-0097677, Aug. 21th, 2018.
18. 이흥노, 이웅비, 김철순, “촬상장치, 촬상방법, 거리측정장치, 및 거리측정방법” , registration number: 10-1865126, registration date: May 31th, 2018.
19. 이흥노, 이웅비, 제임스올리버, “분광장치 및 분광방법”, registration number: 10-1854815, registration date: Apr. 27th, 2018.
20. 장환철, 이흥노, “현미경”, registration number: 10-1766328, registration date: Aug. 2nd, 2017.
21. 이흥노, 장환철, 이웅비, “다수의 렌즈를 이용한 촬상장치 (분할출원)”, registration number: 10-1692428, registration date: Dec. 28th, 2016.
22. 이흥노, 장환철, 이웅비, “다수의 렌즈를 이용한 촬상장치”, registration number:10-1638022, registration date: July 4th, 2016.
23. 이흥노, 장환철, “내시경”, registration number: 10-1638016, registration date:: July 4th, 2016
24. 이흥노, 이웅비, 제임스올리버, “랜덤필터모듈의 투과율 검출방법”, , registration number:10-1572080, registration date: Nov 20th, 2015.
25. 이흥노, 이웅비, 제임스올리버, “랜덤필터모듈, 랜덤필터모듈의 투과율 검출방법, 및 랜덤필터모듈을 이용하는 분광기”, registration number: 10-1526870, registration date: June 2nd, 2015.
26. 이흥노, 장환철, “미모시스템의 신호 복구를 위한 스피어 디코딩 방법 및 그 시스템”, registration number: 10-1499448, registration date: Mar. 2nd, 2015.
27. 이흥노, 장환철, “미모 시스템의 신호 복구를 위한 스피어 디코딩 방법 및 그 시스템”, registration number: 10-1498267, registration date: Feb. 25th, 2015.
28. 이흥노, 장환철, “다중 안테나 시스템의 신호 복구를 위한 초월 평면 스피어 디코딩 방법 및 이를 위한 장치”, registration number: 10-1423965, registration date: Jul. 22th, 2014.
29. 이흥노, 박상준, 제임스올리버, 이웅비, “신호의 희소 특성을 이용한 분광계의 광 신호 처리 방법 및 그 장치”, registration number: 10-1423964, registered date: Jul. 22th, 2014.
30. 이흥노, 신영학, 이승찬, “뇌-컴퓨터 접속 장치, 그리고 그의 분류 방법”, registration number: 10-1284569, registration date: Mar. 27th, 2014.
31. 이흥노, 이수제, 최재건, “제한된 전력 범위의 선형 증폭기가 장비된 수신 장치에서의 안정적인 통신을 위해 희소 신호를 이용하는 신호 전송과 수신 및 복구 방법”, registration number: 10-1352618, registration date: Jan. 10th, 2014.
32. 이흥노, 성진택, “유한체의 희소 신호 복구 방법 및 장치”, registeration number: 10-1284569, registered date: July, 4th, 2013.
33. 이흥노, 김현주, 하동수, “상관관계 있는 신호의 전송 방법과 이를 구현한 송신기, 그리고 상관관계 있는 신호의 복원 방법과 이를 구현한 수신기”, registration number: 10-1270238, registration date: May. 27th, 2013.
34. 이흥노, 장환철, “현미경” registration number: 10-1766328, registration date: Aug. 2th, 2017.
35. 이흥노, 제임스올리버, 이웅비, “분광장치 및 분광방법 (Apparatus for Improving Spectral resolution using Random Transmittances in Optical Spectrometers)”, registration number: 10-1854815, registration date: Apr. 27th, 2018.
36. 이흥노, 이준호, 박상준, “분산적 압축 센싱 및 협력 복구를 수행하는 신호취득 장치 및 그 방법”, registration number: 10-1112746, registered date: Jan. 30th, 2012.
37. 임혁, 최우열, 이흥노, 김태운, “다중 패킷 수신 환경에서의 다중 접근 통신을 위한 전송파 위상 조절 장치 및 방법”, registration number: 10-1117791, registered date: Feb. 10th, 2012.
38. 이흥노, 강재욱, 김기선, “희소 신호 전송 방법 및 장치, 그리고 희소 신호 복구 방법 및 장치” registration number: 10-1209908, registered date: Dec. 3rd, 2012.
39. 이흥노, 강주성, “SRC 기반의 RF 핑커프린팅 장치 및 방법 (RF Fingerprinting Apparatus and method using Sparse Representation Classifier Technique)”, Application number: 10-2016-0112772, Sept. 1st, 2016.
40. 이흥노, Zafar Iqbal, “무선 센서 네트워크의 데이터 처리장치 및 데이터 처리 방법, Data processing apparatus and method for wireless sensor network,” Application number: 10-2016-0066625, May 30th, 2016.
41. 이흥노, Zafar Iqbal, “센싱 데이터 처리장치 및 데이터 처리방법, Sensed data processing apparatus and method,” Application number: 10-2016-0066621, May 30th, 2016.
42. 이흥노, 이웅비, “무선 다중 접속 망을 위한 노드 감시 시스템 및 방법, Node Observation Method and System from wireless access network,” application number: 2013-0151395, Dec. 6th, 2013.
43. 이흥노, 이웅비, “무선 다중 접속망 관리 시스템 및 방법, Control Method and System for wireless access network,” application number: 2013-0151397, Dec. 6th, 2013.