JUNSEOB KIM

Captain, Republic of Korea Army

Department of Electrical Engineering, Korea Military Academy, Seoul, Republic of Korea

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EDUCATION

Masters of Science, Electrical and Computer Engineering   2018 - 2020
Texas A&M University, College Station, Texas, USA
Supervised by Prof. Robert D. Nevels, GPA: 4.0/4.0
Thesis: Propagation of High Power and Short Electromagnetic Wave in Nonlinear Dispersive Media

Bachelor of Science, Electrical Engineering   2012 - 2016
Korea Military Academy, Seoul, Republic of Korea
Supervised by Prof. Yongchul Kim, GPA(Major): 4.14/4.3 (Graduate with honors)

RESEARCH INTERESTS

Radar Signal Processing, Machine Learning, Optimization, Molecular Communication

WORK EXPERIENCE

Assistant Professor, Department of Electrical Engineering, Korea Military Academy   2021 - Present

Education and Analysis Officer, Leadership Center, Korea Military Academy   2022 - 2023

Full-time Instructor, Department of Electrical Engineering, Korea Military Academy   2020 - 2021

Reconnaissance Battalion Platoon Leader, 17th Infantry Division, Republic of Korea Army   2016 - 2017

PUBLICATIONS

Journal Papers

[J11] S. Cho, **J. Kim**, W. Lee, and Y. Choi, **"Enhancing LPI Signal Classification through Machine-Learning Based Pulse Integration,"** Under Review.

[J10] **J. Kim**, S. Cho, S. Hwang, W. Lee, and Y. Choi, **"Enhancing LPI Radar Signal Classification through Patch-Based Noise Reduction,"** Under Review.

[J9] **J. Kim**, S. Cho, P. Park, S. Park, and W. Lee, "Advancements in Drone Detection Radar for Cyber Electronic Warfare," Accepted to *Journal of Convergence Security*.

[J8] **J. Kim**, S. Cho, J. P. Coon, A. A. Castrejon-pita, and H. Arjmandi, **"Electrophoretic Molecular Communication with Piecewise Constant Electric Field,"** in ***IEEE Transactions on Nanobioscience***, vol. 22, no. 3, pp.622-629, Jul. 2023.

[J7] **J. Kim**, S. Park, Y. You, and Y. Kim, "Scenario-Based Future Infantry Brigade Information Distribution Capability Analysis," in *Journal of Convergence Security*, vol. 23, no. 1, pp.139-145, Mar. 2023.

[J6] P. Park, S. Park, S. Cho, **J. Kim**, and Y. Kim, "A Study on the Prediction Method of Information Exchange Requirement in the Tactical Network," in *Journal of Convergence Security*, vol. 22, no. 5, pp.95-105, Dec. 2022.

[J5] **J. Kim**, S. Park, J. Cha, and Y. Kim, **"Future Tactical Communication System Development Plan through Army TIGER Information Distribution Capability Analysis," in *Journal of Convergence Security***, vol. 21, no. 4, pp. 23-30, Oct. 2021.

[J4] **J. Kim**, S. Park, J. Cha, and Y. Kim, "Future Tactical Communication System Development Plan," in *Journal of Convergence for Information Technology*, vol. 11, no. 6, pp. 14-23, Jun. 2021.

[J3] H. Kwon, J. Yoon, **J. Kim**, S. Park, and Y. Kim, "Detecting Adversarial Example Using Ensemble Method of Deep Neural Network," in *Journal of Convergence Security*, vol. 21, no. 2, pp. 57-66, Jun. 2021.

[J2] S. Park, W. Lee, Y. Kim, **J. Kim**, and O. Jo, "A Study on the Operation of Multi-Beam Antenna for Airborne Relay UAV Considering the Characteristics of Aircraft," in *Journal of Convergence for Information Technology*, vol. 11, no. 4, pp. 26-34, Apr. 2021.

[J1] **J. Kim**, H. Jeong, and Y. Kim, "A Study on Application of Internet of Things for Combat Personnel and Combat Units in Military," in *Korean Journal of Military Art and Science*, vol. 8, no. 2, pp. 169-184, Dec. 2015.

Conference Papers

[C5] **J. Kim**, S. Cho, S. Hwang, and Y. Choi, **"Automatic LPI Radar Waveform Recognition Using Vision Transformer," in *IEEE International Radar Conference***, Sydney, Australia, Nov. 2023. Oral Presentation.

[C4] **J. Kim**, S. Cho, S. Hwang, Y. Choi, and W. Lee, "Trends and Development Plans of Deep Learning Approaches for LPI Radar Recognition," in *Symposium of the KICS*, Jeju, Korea, Jun. 2023. Oral Presentation.

[C3] **J. Kim**, S. Cho, H. Lee, and I. Son, "Future Tactical Communication System Development Plan Utilizing Core Technologies of the 4th Industrial Revolution," in *Symposium of the KICS*, Jeju, Korea, pp. 679-680, Jun. 2022. Oral Presentation.

[C2] A. A. Voronin, **J. Kim**, P. Yang, R. D. Nevels, and A. M. Zheltikov, **"Propagation of Low-Frequency Broadband Electromagnetic Field Waveforms in the Atmosphere," in *IEEE International Symposium on APS/URSI***, Atlanta, USA, pp. 2133-2134, Jul. 2019.

[C1] **J. Kim**, H. Jeong, and Y. Kim, "Improving Military Night Duty System Using IoT," in *Symposium of the KICS*, Seoul, Korea, pp. 374-375, Nov. 2015.

Book Chapters

[B1] W. Lee, Y. Kim, S. Cho, P. Park, **J. Kim**, W. Lim, I. Son, S. Park, *Military Communications and Electronics*, 2nd ed, Gold Egg Publishing Company, 2023.

RESEARCH EXPERIENCE

10. Development of Methods for Tracking, Verification, and Removal of Unknown Terrorist Substances (III)
    National Institute of Chemical Safety   May. 2023 – Nov. 2023

9. **Low Probability of Intercept (LPI) Radar Signal Classification using Deep Learning Techniques**
   Future Strategy and Technology Research Institute   Mar. 2023 – Dec. 2023

8. Cyber Electronic Warfare Operations Concept for Drone Operations
   Hwarangdae Research Institute   Mar. 2023 – Dec. 2023

7. **Development of Predictive Technology for Terrorist Material Characteristics (III)**
   National Institute of Chemical Safety   Jun. 2022 – Nov. 2022

6. **Research and Development of Intelligent Radar Signal Detection Technology**
   Korea Research Inst. for Defense Technology Planning and Advancement   May. 2022 – May. 2024

5. Enhancement of Physical Layer Security Transmission Techniques for Visible Light Communication
   National Research Foundation of Korea   Mar. 2022 – Mar. 2025

4. **Analysis on Information Exchange Capability of Military Satellite Communication System-III**
   Agency for Defense Development   Dec. 2021 – Aug. 2022

3. Research on the Application of Cyber Electronic Warfare in the Army
   Hwarangdae Research Institute   Mar. 2021 – Dec. 2021

2. Analysis on Information Exchange Capability of Mobile Integrated Communication System
   Agency for Defense Development   Dec. 2020 – Aug. 2021

1. Analysis of Domestic Operational Environment and Operational Concepts for Establishing an Aerial Network
   Agency for Defense Development   Dec. 2020 – May. 2021

AWARDS & HONORS

- Two Awards for Recognition of the Excellence in Service, Awarded by the Superintendent of KMA 2022, 2023
- Award for Contribution to Leadership Research, Awarded by the Commandant of KMA 2022
- **Outstanding Performance in M.S. Study, Awarded by Army Human Resource Commander** 2020
- Best Platoon of the Division, Awarded by the 17$^{\text{th}}$ Infantry Division Commander 2016
- *JAEGU* **Award, Awarded at the Graduation Ceremony by the Superintendent of KMA** 2016
- **Best Graduate Dissertation Award, Awarded by Dean of the Academic Board of KMA** 2015
  * KMA stands for Korea Military Academy

SCHOLARSHIPS

- **Republic of Korea Army Graduate Study Scholarship (M.S.) ($45,000/year)** 2018 - 2020
- Texas A&M University Graduate Student Travel Grant ($1,000) Jul. 2019
- *BYUNGSOO RHO* **Scholarship Prize for the Best Paper Award ($1,200)** Jun. 2015

TEACHING EXPERIENCE (AT KOREA MILITARY ACADEMY)

- Engineering Mathematics Fall 2021, Spring & Fall 2022, Spring 2023
  Lecture Evaluation: 4.84/5.0
- AI-Centric Future Military ICT Spring & Fall 2021, Spring & Fall 2022, Spring & Fall 2023
  Lecture Evaluation: 4.74/5.0
- Military Communications and Electronics Fall 2020, Fall 2023
  Lecture Evaluation: 4.79/5.0
- Introduction to Military Engineering Spring 2021
- Military Engineering Projects Spring 2021, Spring & Fall 2022

COMPUTING SKILLS

- Programming: MATLAB, Python, C#
- Tools: Git/GitHub, VS Code, PyTorch, LaTeX, COMSOL Multiphysics, Unity