JUNSEOB KIM

Major, Republic of Korea Army
Pierre R. Lamond Department of Electrical and Computer Engineering, Duke University
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EDUCATION

Ph.D. Student, Electrical and Computer Engineering — 2025 – Present
Duke University, Durham, North Carolina, USA
Supervised by Prof. Rishikesan Kamaleswaran, GPA: 4.0/4.0

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

AI in Healthcare, Signal Processing, Machine Learning, Medical Video Understanding

WORK EXPERIENCE

Research Assistant, Kamaleswaran Lab, Duke University — 2025 - Present

Assistant Professor, Department of Electrical Engineering, Korea Military Academy — 2021 - 2024

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

[J14] **J. Kim**, T. Choudhary, M. Hassanuzzaman, and R. Kamaleswaran, "Deep Learning and Dual-Domain Fusion of Temporal and Spectrotemporal SCG for Valvular Heart Disease Classification," in *Biomedical Physics & Engineering Express*, Oct. 2026.

[J13] **J. Kim**, J. Chng, A. Ali, V. Moas, S. Hwang, and R. Kamaleswaran, "TC3-VLM: A Vision–Language Model for Tactical Combat Casualty Care," in *IEEE Access*, Aug. 2026.

[J12] **J. Kim**, S. Park, Y. You, and Y. Kim, "Analysis of Information Distribution Capability of the Army TIGER Corps Multilayer Integrated Communication Network," in *Journal of Convergence Security*, vol. 24, no. 2, pp. 175-180, Jun. 2024.

[J11] **J. Kim**, S. Cho, S. Hwang, W. Lee, and Y. Choi, "Analysis of Deep Learning Model for Arbitrary Intercepted LPI Signal Classification," in *The Journal of Korean Institute of Electromagnetic Engineering and Science*, vol. 35, no. 3, pp. 232-238, Mar. 2024.

[J10] **J. Kim**, S. Cho, S. Hwang, W. Lee, and Y. Choi, "Enhancing LPI Radar Signal Classification Through Patch-Based Noise Reduction," in *IEEE Signal Processing Letters*, vol. 31, pp. 716-720, Feb. 2024.

[J9] **J. Kim**, S. Cho, P. Park, S. Park, and W. Lee, "Advancements in Drone Detection Radar for Cyber Electronic Warfare," in *Journal of Convergence Security*, vol. 23, no. 3, pp. 73-81, Sep. 2023.

[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

[C8] **J. Kim**, A. Nagori, T. Choudhary, M. Hassanuzzaman, and R. Kamaleswaran, "Capacity-Neutral Training Transfers Across Sites in Multimodal Sleep Prediction of Future Cognitive Impairment," in *Computing in Cardiology (CinC)*, Madrid, Spain, Sep. 2026.

[C7] **J. Kim**, S. Hwang, M. Arora, and R. Kamaleswaran, "Hard-First: Entropy-Guided Curriculum Distillation Balances Transfer and Preservation in Biomedical Vision-Language Models," in *ICML 2026 Workshop on Continual Adaptation at Scale: Towards Sustainable AI*, Seoul, Korea, Jul. 2026.

[C6] **J. Kim**, S. Park, Y. You, and Y. Kim, "A Scenario Study for Information Distribution Analysis of Multi-Layer Integrated Tactical Communication Networks," in *Symposium of the KICS*, Pyeongchang, Korea, pp. 635-636, Jan. 2024.

[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.

Conference Abstracts

[A1] P. Krishnan, A. Ali, **J. Kim**, T. Choudhary, and R. Kamaleswaran, "Intraoperative Photoplethysmography Waveform-Based Prediction of Post-Operative Acute Kidney Injury," in *Shock*, vol. 64, no. 2, p. S64, Aug. 2025.

Preprints and Manuscripts Under Review

[P3] **J. Kim**, H. Shi, M. C. Fiedorek, H. D. Kilday, H. P. Foote, C. P. Hornik, R. Kamaleswaran, and J. B. Long, "PORT: Generative EHR Pretraining for Pediatric Intraoperative Risk Prediction," Under review at *BMC Pediatrics*.

[P2] **J. Kim**, J. Chng, A. Ali, V. Moas, Y. Lee, P.-C. Chin, S. Hwang, and R. Kamaleswaran, "A Doctrine-Grounded Visual Question Answering Dataset for Tactical Combat Casualty Care," Under review at *Scientific Data*; *arXiv preprint arXiv:2610.07339*, Oct. 2026.

[P1] Y. Yang, M. Arora, R. Zhang, B. Abed, **J. Kim**, T. Choudhary, M. Hassanuzzaman, K. Zhu, A. Ali, C. Yang, A. E. Gent, V. Moas, and R. Kamaleswaran, "Clin-JEPA: A Multi-Phase Co-Training Framework for Joint-Embedding Predictive Pretraining on EHR Patient Trajectories," *arXiv preprint arXiv:2605.10840*, May 2026.

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

Kamaleswaran Lab, Duke University

- AI-Assisted Trauma Video Review for Resuscitation Assessment — Feb. 2026 – Present
- Generative EHR Foundation Models for Pediatric Perioperative Risk Prediction — Jul. 2025 – Present
- Valvular Heart Disease Classification from Seismocardiography — May. 2025 – Dec. 2025
- Organization and Evaluation of the 2024 Pediatric Sepsis Data Challenge — Jan. 2025 – Dec. 2025

Korea Military Academy

- Development of Methods for Tracking, Verification, and Removal of Unknown Terrorist Substances (III)
  National Institute of Chemical Safety — May. 2023 – Nov. 2023
- Low Probability of Intercept (LPI) Radar Signal Classification using Deep Learning Techniques
  Future Strategy and Technology Research Institute — Mar. 2023 – Dec. 2023
- Cyber Electronic Warfare Operations Concept for Drone Operations
  Hwarangdae Research Institute — Mar. 2023 – Dec. 2023
- Development of Predictive Technology for Terrorist Material Characteristics (III)
  National Institute of Chemical Safety — Jun. 2022 – Nov. 2022
- Research and Development of Intelligent Radar Signal Detection Technology
  Korea Research Inst. for Defense Technology Planning and Advancement — May. 2022 – May. 2024
- Enhancement of Physical Layer Security Transmission Techniques for Visible Light Communication
  National Research Foundation of Korea — Mar. 2022 – Mar. 2025
- Analysis on Information Exchange Capability of Military Satellite Communication System-III
  Agency for Defense Development — Dec. 2021 – Aug. 2022
- Research on the Application of Cyber Electronic Warfare in the Army
  Hwarangdae Research Institute — Mar. 2021 – Dec. 2021

- Analysis on Information Exchange Capability of Mobile Integrated Communication System
  Agency for Defense Development Dec. 2020 – Aug. 2021
- Analysis of Domestic Operational Environment and Operational Concepts for Establishing an Aerial Network
  Agency for Defense Development Dec. 2020 – May. 2021

AWARDS & HONORS

- 2nd Place ($300,000 Prize), DARPA Triage Challenge Phase 3 Data Competition (Team OCA-Sentinel) 2026
- 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 17th 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

- Duke University ECE Travel Grant ($1,250) 2026
- Republic of Korea Army Graduate Study Scholarship (M.S.) 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

Duke University

- Teaching Assistant, ECE 590: Practical Machine Learning Fall 2026

Korea Military Academy

- Engineering Mathematics Fall 2021, Spring & Fall 2022, Spring 2023
- AI-Centric Future Military ICT Spring & Fall 2021, Spring & Fall 2022, Spring & Fall 2023
- Military Communications and Electronics Fall 2020, Fall 2023
- 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