Sohyun Kim

M.S. Student at KAIST Mobility, AIS Lab

RESEARCH PROFILE

Probabilistic state estimation and nonlinear filtering; situational awareness; target tracking and guidance.

EDUCATION

Korea Advanced Institute of Science and Technology (KAIST) — Feb 2025 - Present
M.S. Student, Cho Chun Shik Graduate School of Mobility
Daejeon, Republic of Korea

Chung-Ang University — Mar 2019 - Feb 2025
B.S. in Mechanical Engineering
Seoul, Republic of Korea | GPA: 4.43/4.50

RESEARCH EXPERIENCE

Autonomous and Intelligent Systems (AIS) Lab — Feb 2025 - Present
Cho Chun Shik Graduate School of Mobility, KAIST

Probabilistic State Estimation, Threat Assessment, Railway Vehicle Condition Monitoring

Autonomous and Intelligent Systems Lab (AISL) — 2024 - 2025
Department of Mechanical Engineering, Chung-Ang University

Missile Guidance Filter, LSTM-Enhanced Target Tracking

PUBLICATIONS

Journal Articles

1. **Sohyun Kim**, Geunwoo Lee, and Hyo-Sang Shin. "Shaping-Filter Augmented Constrained EKF for Equivalent Conicity Estimation of Railway Vehicles." *Zenodo*, preprint, July 2026.
   doi:10.5281/zenodo.21482512
2. **Sohyun Kim**, Sukkeun Kim, Jik Hur, and Hyo-Sang Shin. "Aerial Threat Assessment: A Comprehensive Review of Methodologies, Attributes, and a Novel Validation Framework." *SSRN*, preprint, July 2026.
   doi:10.2139/ssrn.7111691
3. **Sohyun Kim** and Hyo-Sang Shin. "A Two-Dimensional Bayesian Continuous Attractor Neural Network for Robust Spatial State Estimation." *Research Square*, preprint, June 2026.
   doi:10.21203/rs.3.rs-9897709/v1
4. **Sohyun Kim**, Hyungbin Kim, and Seokwon Lee. "Adaptive censoring-probability-based Tobit Kalman filter for tracking maneuvering targets." *Aerospace Science and Technology*, 163:110263, 2025.
   doi:10.1016/j.ast.2025.110263
5. **Sohyun Kim**, Jaehoon Choi, Dayeon Jeong, and Seokwon Lee. "LSTM-based Kalman Filter Error Compensation for Enhanced Moving Object Tracking." *Journal of Institute of Control, Robotics and Systems*, 31(1):68–76, 2025.
   doi:10.5302/J.ICROS.2025.24.0143

Conference

1. **Sohyun Kim**, Jik Hur, and Hyo-Sang Shin. "Estimation of Distribution Algorithms for Optimizing Threat Assessment Dynamic Bayesian Networks." *2026 KSAS Spring Conference*, Jeju, Republic of Korea, Mar. 2026.
   DBpia record
2. **Sohyun Kim**, Jik Hur, and Hyo-Sang Shin. "Aerial Threat Assessment via Parameter-Updating Dynamic Bayesian Networks." *2025 KSAS Fall Conference*, Gangwon, Republic of Korea, Nov. 2025.
   DBpia record

AWARDS AND HONORS

- **Master's Excellence Scholarship (Science and Engineering)**, Ministry of Science and ICT, Korea — Sep 2025 - Feb 2027
- **National Science & Technology Scholarship (Full Scholarship)**, Ministry of Science and ICT, Korea — Mar 2023 - Feb 2025
- **Top Excellence Award, 2nd EV Energy Challenger**, Korea Energy Agency — Nov 2023
- **Academic Excellence Scholarships**, Chung-Ang University; top of class in Sep 2022 — 2019, 2022