# DONGEON LEE (이동언)

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## RESEARCH INTERESTS

Generative Design, Data-driven Design Optimization, Bayesian Optimization (BO), Uncertainty Quantification (UQ), Engineering Applications of Artificial Intelligence, Virtual Product Development (VPD)

## EDUCATION

Integrated PhD Student
Feb. 2023 ~ Present

**Korea Advanced Institute of Science and Technology (KAIST)**, Daejeon, Korea
- Cho Chun Shik Graduate School of Mobility
- Advisor: Prof. Namwoo Kang

B.S.
Mar. 2011 ~ Feb. 2017

**Pusan National University (PNU)**, Busan, Korea
- Department of Mechanical Engineering
- Advisor: Prof. Changmin Son
  (Currently at Virginia Tech (USA), Rolls-Royce Commonwealth Professor)
- Received Academic Excellence Scholarship for all semesters
  (Incl. **National Science & Technology Scholarship**)
- Graduated **Summa Cum Laude** (GPA: 4.20 / 4.5)

## PROFESSIONAL EXPERIENCE

**Hanwha Defense** (Currently Hanwha Aerospace) — Changwon, Korea
**Associate Research Engineer**, ILS (Integrated Logistics Support) Center, Research Institute — Dec. 2016 ~ May 2022

**KAIST NQe (Nuclear & Quantum Engineering) Internship Program** — Daejeon, Korea
**Intern Researcher**, NPNP (Nuclear Power and Propulsion Laboratory) — July 2015

## AWARDS

**Silver Prize**, 2025 Korean Society of Mechanical Engineers (KSME), CAE & Applied Mechanics Division Spring Conference (Apr. 2025)

## RESEARCH PROJECT

Mar. 2023 ~ Present
**Development of fundamental technology for virtual product design to analyze suitable areas for renewable ocean energy**
Sponsored by KRISO (Korea Research Institute of Ships & Ocean Engineering)
- Role: Project Leader

Mar. 2023 ~ July 2023
**Real-time prediction of wave height using AI for digital twin of wave energy converter**
Sponsored by KRISO (Korea Research Institute of Ships & Ocean Engineering)
- Role: Project Leader

Nov. 2019 ~ May 2022
**Development of Redback IFV ILS (Integrated Logistics Support) elements (CBM$^+$ / Training (VR/AR))**
Sponsored by CoA (Commonwealth of Australia) & HDA (Hanwha Defense of Australia)
- Role: Project Engineer

Dec. 2016 ~ Oct. 2019
**Development of K21 IFV (Infantry Fighting Vehicle) depot maintenance elements**
Sponsored by ROK (Republic of Korea) Army
- Role: Project Engineer

July 2015
**Verification of the GAMMA$^+$ code with the supercritical $CO_2$ ($S\text{-}CO_2$) compressor test data about the accident scenarios which are related to cooling water loop**
Sponsored by KAIST NQe NPNP
- Advisor: Prof. Jeongik Lee
- Role: Intern Researcher

## TECHNICAL SKILLS

| | |
|---|---|
| **Programming Language:** | Python, MATLAB |
| **Operating System:** | Linux, Docker, Windows |
| **Framework:** | PyTorch, TensorFlow |

## LICENSE

**Big Data Analysis Engineer**

**[Details on the license]**
- License Number: BAE-003002950 (Dec. 31, 2021)
- Relevant Government Ministries: Ministry of Science and ICT & Statistics Korea
- Implementing Agency: Korea Data Agency

## TEACHING EXPERIENCES

**KAIST**

Teaching Assistant, Fall 2024, CoE491: Smart Mobility Design for Designer, Engineer, and Data Scientist
(Practice Codes: https://www.smartdesignlab.org/teaching/dl_kaist_coe)

## PUBLICATIONS

* corresponding author, † equal contribution

### Journal Papers (International)

3. **Lee, D.**, and Kang, N.*, "Generative Model-driven Design Optimization to Address Small Data Challenges in Manufacturing (tentative title)", (In Preparation)
2. **Lee, D.**†, Lee, U.†, Shin, J., Lee, Y.*, and Kang, N.*, "Multi-scale and Multi-physics Design Optimization for EVs (tentative title)", (In Preparation)
1. **Lee, D.**, Yang, S., Oh, J., Cho, S., Kim, S., and Kang, N.*, "AI-powered Digital Twin of the Ocean: Reliable Uncertainty Quantification for Real-time Wave Height Prediction with Deep Ensemble", (Under Review)

### Conference Proceeding (Korean)

13. **Lee, D.**, and Kang, N.* (2025) "소량 데이터 문제 극복을 위한 파운데이션 모델 활용 위상 최적화", 대한기계학회 CAE 및 응용역학부문 2025 년도 춘계학술대회
12. **Lee, D.**, Kim, S., Kim, J., Cho, S., and Kang, N.* (2024) "파력발전시스템의 연간 에너지 생산량 예측 모델을 위한 베이지안 하이퍼파라미터 최적화에 대한 연구", 대한기계학회 2024 년 학술대회
11. **Lee, D.**, Yang, S., Oh, J., Cho, S., Kim, S., and Kang, N.* (2024) "파력발전시스템의 디지털 트윈을 위한 딥러닝 기반 실시간 수위 예측의 불확실성 정량화에 대한 연구", 대한기계학회 CAE 및 응용역학부문 2024 년도 춘계학술대회
10. **Lee, D.**, Oh, J., Cho, S., and Kang, N.* (2023) "도메인 지식 기반 딥러닝을 활용한 불규칙 시계열 데이터 실시간 예측 연구: OWC-WEC 시스템 사례", 대한기계학회 2023 년 학술대회
9. **Lee, D.**, Oh, J., Kim, K., Cho, S., and Kang, N.* (2023) "LSTM 을 이용한 진동수주형 파력발전장치 수주높이 실시간 예측 연구", 대한기계학회 CAE 및 응용역학부문 2023 년도 춘계학술대회
8. Park, M., Sohn, J., **Lee, D.**, (2021) "시뮬레이션용 오픈 아키텍처 적용 사례 연구", 한국군사과학기술학회 종합학술대회, pp. 1561-1562.
7. Lee, D., **Lee, D.**, (2021) "해외사업 기반의 상태기반정비 (CBM) 적용대상 선정 프로세스 연구", 한국군사과학기술학회 종합학술대회, pp. 1501-1502.
6. **Lee, D.**, Sung, R., Lee, D., (2021) "호주 LAND400 Ph.3 사업기반 ADDIE 모델을 활용한 군 교육훈련 개발방안 연구", 한국군사과학기술학회 종합학술대회, pp. 1499-1500.
5. Sohn, J., Park, M., **Lee, D.**, (2021) "효과적인 교육 훈련을 위한 과학화 훈련 발전방향에 대한 고찰", 한국군사과학기술학회 종합학술대회, pp. 1444-1445.
4. **Lee, D.**, Sohn, J., Park, M., (2020) "ADDIE 모델을 활용한 군 교육 콘텐츠 개발방안 연구", 한국군사과학기술학회 종합학술대회, pp. 1873-1874.
3. Park, M., Sohn, J., **Lee, D.**, (2020) "훈련 시스템의 개방형 아키텍처 적용에 관한 연구", 한국군사과학기술학회 종합학술대회, pp. 1851-1852.

2. Sohn, J., Park, M., **Lee, D.**, (2020) “전투차량 수출사업 훈련시스템 요구사항에 대한 고찰”, 한국군사과학기술학회 종합학술대회, pp. 1837-1838.

1. Lee, D., **Lee, D.**, Lee, S., (2018) “사용자 중심의 창정비 종합군수지원요소 식별 및 적용방안에 대한 연구”, 한국군사과학기술학회 종합학술대회, pp. 1983-1984.