

## Sunghoon Lim, Ph.D.

Room 301-10, Engineering Building 5 (Building 112),  
50, UNIST-gil, Eonyang-eup, Ulju-gun, Ulsan 44919, Republic of Korea  
+82-52-217-3119

[sunghoonlim@unist.ac.kr](mailto:sunghoonlim@unist.ac.kr)

<http://sunghoonlim.unist.ac.kr/>

<https://iii.unist.ac.kr/>

### **Academic Appointments**

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- Sep. 2022 – Present     **Associate Professor**, Department of Industrial Engineering  
Ulsan National Institute of Science and Technology (UNIST), Ulsan, Republic of Korea
- Aug. 2018 – Aug. 2022   **Assistant Professor**, Department of Industrial Engineering  
UNIST, Ulsan, Republic of Korea
- Jun. 2023 – Present     **Adjunct Associate Professor**, Graduate School of Artificial Intelligence (AIGS)  
UNIST, Ulsan, Republic of Korea
- Jun. 2021 – Present     **Head**, Industry Intelligentization Institute  
UNIST, Ulsan, Republic of Korea

### **Education**

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- Jan. 2014 – May 2018   **Ph.D.** Industrial Engineering  
The Pennsylvania State University, University Park, Pennsylvania, United States (Advisor:  
Dr. Conrad S. Tucker)  
Dissertation Title: EVENT DETECTION AND PREDICTION USING ONLINE USER  
GENERATED DATA  
Dissertation Committee: Dr. Conrad S. Tucker, Dr. Soundar Kumara,  
Dr. Ling Rothrock, Dr. Nilam Ram
- Aug. 2012 – Dec. 2013   **M.S.** Industrial Engineering  
The University of Pittsburgh, Pittsburgh, Pennsylvania, United States (Advisor: Dr. Jayant  
Rajgopal)
- Mar. 2006 – Jan. 2009   **M.S.** Industrial Engineering  
KAIST, Daejeon, Republic of Korea (Advisor: Dr. Chang Sup Sung)
- Mar. 2001 – Aug. 2005   **B.S.** Industrial Engineering  
KAIST, Daejeon, Republic of Korea

**Selected International Journal Publications (†: Corresponding Author, #: Equal Contribution)**

Kim, Gyeongho, Jae Gyeong Choi, and **Sunghoon Lim**<sup>†</sup>. “Using Transformer and a Reweighting Technique to Develop a Remaining Useful Life Estimation Method for Turbofan Engines.” *Engineering Applications of Artificial Intelligence* (Accepted for Publication)

Choi, Jae Gyeong<sup>#</sup>, Dong Chan Kim<sup>#</sup>, Miyoung Chung<sup>#</sup>, **Sunghoon Lim**<sup>†</sup>, and Hyung Wook Park<sup>†</sup>. “Multimodal 1D CNN for delamination prediction in CFRP drilling process with industrial robots.” *Computers & Industrial Engineering* 190 (2024): 110074.

Kim, Gyeongho, Sang Min Yang, Sin Won Kim, Do Young Kim, Jae Gyeong Choi, Hyung Wook Park, and **Sunghoon Lim**<sup>†</sup>. “A multi-domain mixture density network for tool wear prediction under multiple machining conditions.” *International Journal of Production Research* (2023): <https://doi.org/10.1080/00207543.2023.2289076>

Kim, Gyeongho<sup>#</sup>, Sang Min Yang<sup>#</sup>, Dong Min Kim, Sinwon Kim, Jae Gyeong Choi, Minjoo Ku, **Sunghoon Lim**<sup>†</sup>, and Hyung Wook Park<sup>†</sup>. “Bayesian-Based Uncertainty-Aware Tool-Wear Prediction Model in End-Milling Process of Titanium Alloy.” *Applied Soft Computing* 148 (2023): 110922.

Kim, Gyeongho, Jae Gyeong Choi, Minjoo Ku, and **Sunghoon Lim**<sup>†</sup>. “Developing a semi-supervised learning and ordinal classification framework for quality level prediction in manufacturing.” *Computers & Industrial Engineering* 181 (2023): 109286.

Tama, Bayu Adhi, Malinda Vania, Seungchul Lee<sup>†</sup>, and **Sunghoon Lim**<sup>†</sup>. “Recent Advances in the Application of Deep Learning Techniques for Fault Detection Using Vibration Signals: A Systematic Review.” *Artificial Intelligence Review* 5 (2023): 4667–4709.

Tama, Bayu Adhi, and **Sunghoon Lim**<sup>†</sup>. “Ensemble learning for intrusion detection systems: A systematic mapping study and cross-benchmark evaluation.” *Computer Science Review* 39 (2021): 100357.

**Lim, Sunghoon**<sup>†</sup>, Sun Jun Kim, YoungJae Park, and Nahyun Kwon. “A deep learning-based time series model with missing value handling techniques to predict various types of liquid cargo traffic.” *Expert Systems with Applications* 184 (2021): 115532.

Choi, Jae Gyeong, Chan Woo Kong, Gyeongho Kim, and **Sunghoon Lim**<sup>†</sup>. “Car crash detection using ensemble deep learning and multimodal data from dashboard cameras.” *Expert Systems with Applications* 183 (2021): 115400.

**International Journal Publications (†: Corresponding Author, #: Equal Contribution)**

Kim, Gyeongho, Soyeon Park, Jae Gyeong Choi, Sang Min Yang, Hyung Wook Park, and **Sunghoon Lim**<sup>†</sup>. “Developing a Data-driven System for Grinding Process Parameter Optimization Using Machine Learning and Metaheuristic Algorithms.” *CIRP Journal of Manufacturing Science and Technology* 51 (2024): 20-35

Vania, Malinda<sup>#</sup>, Bayu Adhi Tama<sup>#</sup>, Hasan Maulahela, and **Sunghoon Lim**<sup>†</sup>. “Recent Advances in Applying Machine Learning and Deep Learning to Detect Upper Gastrointestinal Tract Lesions.” *IEEE Access* 11 (2023): 66544 - 66567.

Kim, Gyeongho<sup>#</sup>, Dong-hyun Shin<sup>#</sup>, Jae Gyeong Choi, and **Sunghoon Lim**<sup>†</sup>. “A Deep Learning-Based Cryptocurrency Price Prediction Model That Uses On-chain Data.” *IEEE Access* 10 (2022): 56232 – 56248.

Kim, Kyudong, Heena No, Kijung Park<sup>†</sup>, Hyun Woo Jeon<sup>†</sup>, and **Sunghoon Lim**. “Characterization of Power Demand and Energy Consumption for Fused Filament Fabrication Using CFR-PEEK.” *Rapid Prototyping Journal* 28, no. 7 (2022): 1394–1406.

Kim, Gyeongho, and **Sunghoon Lim**<sup>†</sup>. “Development of an Interpretable Maritime Accident Prediction System Using Machine Learning Techniques.” *IEEE Access* 10 (2022): 41313-41329.

Tama, Bayu Adhi<sup>#</sup>, Malinda Vania<sup>#</sup>, Iljung Kim, and **Sunghoon Lim**<sup>†</sup>. “An EfficientNet-based Weighted Ensemble Model for Industrial Machine Malfunction Detection Using Acoustic Signals.” *IEEE Access* 10 (2022): 34625-34636.

Hwang, Seong Wook, and **Sunghoon Lim**<sup>†</sup>. “The Charging Infrastructure Design Problem with Electric Taxi Demand Prediction Using Convolutional LSTM.” *European Journal of Industrial Engineering* 16, no. 6 (2022): 1.

Chatterjee, Sujoy, and **Sunghoon Lim**<sup>†</sup>. “A TOPSIS-inspired ranking method using constrained crowd opinions for urban planning.” *Entropy* 24, no. 3 (2022): 371.

Kim, Gyeongho<sup>#</sup>, Jae Gyeong Choi<sup>#</sup>, Minjoo Ku, Hyewon Cho, and **Sunghoon Lim**<sup>†</sup>. “A Multimodal Deep Learning-Based Fault Detection Model for a Plastic Injection Molding Process.” *IEEE Access* 9 (2021): 132455-132467.

Tuarob, Suppawong, Poom Wettayakorn, Ponpat Phetchai, Siripong Traivijitkhun, **Sunghoon Lim**, Thanapon Noraset, and Tipajin Thaipisitukul<sup>†</sup>. “DAViS: A Unified Solution for Data Collection, Analyzation, and Visualization in Real-time Stock Market Prediction.” *Financial Innovation* 7 (2021): 56.

Nkenyereye, Lewis, Bayu Adhi Tama, and **Sunghoon Lim**<sup>†</sup>. “A Stacking-based Deep Neural Network Approach for Effective Network Anomaly Detection.” *Computers, Materials & Continua* 66, no. 2 (2021): 2217-2227.

Tama, Bayu Adhi, and **Sunghoon Lim**<sup>†</sup>. “A Comparative Performance Evaluation of Classification Algorithms for Clinical Decision Support Systems.” *Mathematics* 8, no. 10 (2020): 1814.

Chatterjee, Sujoy, and **Sunghoon Lim**<sup>†</sup>. “A Multi-objective Differential Evolutionary Method for Constrained Crowd Judgment Analysis.” *IEEE Access* 8 (2020): 87647-87664.

**Lim, Sunghoon**, and Conrad S. Tucker<sup>†</sup>. “Mining Twitter data for causal links between tweets and real-world outcomes.” *Expert Systems with Applications: X* 3 (2019): 100007.

**Lim, Sunghoon**, Conrad S. Tucker<sup>†</sup>, Kathryn Jablokow, and Bart Pursel. “A semantic network model for measuring engagement and performance in online learning platforms.” *Computer Applications in Engineering Education* 26, no. 5 (2018): 1481-1492.

Tuarob, Suppawong, **Sunghoon Lim**, and Conrad S. Tucker<sup>†</sup>. “Automated Discovery of Product Feature Inferences within Large Scale Implicit Social Media Data.” *Journal of Computing and Information Science in Engineering* 18, no. 2 (2018): 021017.

**Lim, Sunghoon**, and Conrad S. Tucker<sup>†</sup>. “Mitigating Online Product Rating Biases Through the Discovery of Optimistic, Pessimistic, and Realistic Reviewers.” *Journal of Mechanical Design* 139, no. 11 (2017): 111409.

**Lim, Sunghoon**, Conrad S. Tucker<sup>†</sup>, and Soundar Kumara. “An unsupervised machine learning model for discovering latent infectious diseases using social media data.” *Journal of Biomedical Informatics* 66 (2017): 82-94.

**Lim, Sunghoon**, and Conrad S. Tucker<sup>†</sup>. “A Bayesian Sampling Method for Product Feature Extraction From

Large-Scale Textual Data.” *Journal of Mechanical Design* 138, no. 6 (2016): 061403.

### **International Journal Publications: Under Review (†: Corresponding Author, #: Equal Contribution)**

Choi, Jae Gyeong, Dong Chan Kim, Miyoung Chung, Gyeongho Kim, Hyung Wook Park, and **Sunghoon Lim**<sup>†</sup>. “BLIND” *Expert Systems with Applications* (Under Review)

Jeon, Sujin, Soyeon Park, Joonbum Bae, and **Sunghoon Lim**<sup>†</sup>, “Applying multistep classification techniques to recognize static and dynamic hand gestures in a soft sensor-embedded glove.” *IEEE Sensors Journal* (Under Review)

Kim, Gyeongho<sup>#</sup>, Sang Min Yang<sup>#</sup>, Dong Min Kim, Jae Gyeong Choi, **Sunghoon Lim**<sup>†</sup>, and Hyung Wook Park<sup>†</sup>. “Developing a deep learning-based uncertainty-aware tool wear prediction method using smartphone sensors for the turning process of Ti-6Al-4V.” *Journal of Manufacturing Systems* (Under Review)

### **International Conference Proceedings (†: Corresponding Author)**

Kim, Gyeongho, Sang Min Yang, Sinwon Kim, Dong Min Kim, **Sunghoon Lim**<sup>†</sup>, and Hyung Wook Park<sup>†</sup>. “Tool Wear Prediction in the End Milling Process of Ti-6Al-4V using Bayesian Learning.” In *2022 International Conference on Advanced Mechatronic Systems*, Institute of Electrical and Electronics Engineers (IEEE), 2022.

Chatterjee, Sujoy, and **Sunghoon Lim**<sup>†</sup>. “A TOPSIS-based Multi-objective Model for Constrained Crowd Judgment Analysis.”, In *Eighth AAAI Human Computation and Crowdsourcing (HCOMP-2020)*, 2020. [Works-in-Progress]

**Lim, Sunghoon**, Conrad S. Tucker<sup>†</sup>, Kathryn Jablokow, and Bart Pursel. “Quantifying the Mismatch between Course Content and Students’ Dialogue in Online Learning Environments.” In *ASME 2017 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference*, American Society of Mechanical Engineers, 2017. [**Design Education (DEC) Technical Committee Best Paper**]

### **International Conference Presentations (\*: Presenter, †: Corresponding Author)**

Choi, Jae Gyeong<sup>\*</sup>, Dong Chan Kim, Miyoung Chung, Hyung Wook Park, and **Sunghoon Lim**<sup>†</sup>. “BLIND.” *IISE Annual Conference & Expo 2023*, New Orleans, Louisiana, 2023.

Jeon, Sujin<sup>\*</sup>, Soyeon Park, Hyewon Cho, and **Sunghoon Lim**<sup>†</sup>. “Hand gesture recognition without-of-distribution gesture detection using a soft sensor embedded glove.” *IISE Annual Conference & Expo 2023*, New Orleans, Louisiana, 2023.

Kim, Gyeongho<sup>\*</sup>, and **Sunghoon Lim**<sup>†</sup>. “Development of a Deep Learning-based Uncertainty-aware Predictive Maintenance Method.” *IISE Annual Conference & Expo 2023*, New Orleans, Louisiana, 2023.

Cho, Hyewon<sup>\*</sup>, Nurbolat Aimakov, Inwoo Park, Myeonghoon Choi, Yerim Kim, Geosong Na, **Sunghoon Lim**, and Woonggyu Jung<sup>†</sup>. “Glomerulus quantification with deep learning based on novel multi-modal label-free quantitative phase imaging from a near-infrared (Conference Presentation).” In *Quantitative Phase Imaging IX*, p. PC123890A. SPIE, 2023.

Kim, Gyeongho<sup>\*</sup>, Sang Min Yang, Sinwon Kim, Dong Min Kim, **Sunghoon Lim**<sup>†</sup>, Hyung Wook Park<sup>†</sup>. “Tool Wear Prediction in the End Milling Process of Ti-6Al-4V using Bayesian Learning.” *2022 International Conference on*

*Advanced Mechatronic Systems*, Toyama, Japan, 2022.

Ku, Minjoo\*, Gyeongho Kim, and **Sunghoon Lim**†. “Developing a quality level prediction framework with semi-supervised learning and ordinal classification for UV lamps.” *IISE Annual Conference & Expo 2022*, Seattle, Washington, 2022.

Cho, Hyewon\*, Sujin Jeon, and **Sunghoon Lim**†. “Type 2 Diabetes Risk Scoring via Bayesian Neural Networks.” *IISE Annual Conference & Expo 2022*, Seattle, Washington, 2022.

Hwang, Seong Wook\*, and **Sunghoon Lim**†. “The Charging Infrastructure Design Problem with Electric Taxi Demand Prediction Using Convolutional LSTM.” *INFORMS Annual Meeting*, Seattle, Washington, 2019.

**Lim, Sunghoon**\*, and Conrad S. Tucker†. “Population Health Data Mining with a Real-time Social Network Map.” *CHOT Fall Industry Advisory Board Meeting 2017*, The Center for Health Organization Transformation (CHOT), Birmingham, Alabama, 2017.

**Lim, Sunghoon**\*, Conrad S. Tucker†, and Harriet B. Nembhard. “Sensing Systems for Personalized Telehealth Wellness Management.” *2016 Fall Penn State CHOT Symposium*, The Center for Health Organization Transformation (CHOT), University Park, Pennsylvania, 2016.

Tucker, Conrad S.\*†, **Sunghoon Lim**, Yifeng Yu, and Harriet B. Nembhard. “Sensing Systems for Personalized Telehealth Wellness Management.” *CHOT Spring Industry Advisory Board Meeting 2016*, The Center for Health Organization Transformation (CHOT), Houston, Texas, 2016.

### **Domestic Conference Presentations (\*: Presenter, †: Corresponding Author)**

Park, Soyeon\*, and **Sunghoon Lim**†. “Lightweight anomalous object detection in a fixed-camera environment.” *KIIE Fall Conference*, Ulsan, Republic of Korea, 2023.

Kim, Gyeongho\*, Sang Min Yang, Sin Won Kim, Do Young Kim, Jae Gyeong Choi, Hyung Wook Park, and **Sunghoon Lim**†. “Deep Learning-based Tool Wear Prediction under Multiple Machining Conditions.” *PHM Korea 2023*, Seoul, Republic of Korea, 2023.

Kim, Gyeongho\*, Soyeon Park, Jae Gyeong Choi, Hyeokjoon Choi, and **Sunghoon Lim**†. “Grinding Process Parameter Optimization Using Machine Learning Techniques.” *Korea Data Mining Society Summer Conference*, Gangneung, Republic of Korea, 2023.

Kim, Gyeongho\*, Sangmin Yang, and **Sunghoon Lim**†. “Development of a Bayesian-based Uncertainty-aware Tool Wear Prediction Model in the End Milling Process.” *KIIE Fall Conference*, Incheon, Republic of Korea, 2022.

Ku, Minjoo\*, and **Sunghoon Lim**†. “Development of a deep learning-based anomaly detection model using multivariate time series manufacturing data.” *KIIE Fall Conference*, Incheon, Republic of Korea, 2022.

Jeon, Sujin\*, Soyeon Park, Hyewon Cho, and **Sunghoon Lim**†. “Multistep classification of static and dynamic finger gestures using a soft sensor embedded glove.” *KIIE Fall Conference*, Incheon, Republic of Korea, 2022.

Kim, Gyeongho\*, and **Sunghoon Lim**†. “Development of a Remaining Useful Life Estimation Method Using Transformer and a Reweighting Technique.” *Korea Data Mining Society Summer Conference*, Busan, Republic of Korea, 2022.

Cho, Hyewon\*, Sujin Jeon, Soyeon Park, and **Sunghoon Lim**<sup>†</sup>. “Development of a deep learning-based real-time gesture detection and classification model using a wearable sensing glove.” *KIIE/KORMS Joint Spring Conference*, Jeju, Republic of Korea, 2022.

Choi, Jae Gyeong\*, Dong Chan Kim, Miyoung Chung, **Sunghoon Lim**<sup>†</sup>, and Hyung Wook Park<sup>†</sup>. “BLIND” *KIIE/KORMS Joint Spring Conference*, Jeju, Republic of Korea, 2022.

Choi, Jae Gyeong\*, Chan Woo Kong, Gyeongho Kim, and **Sunghoon Lim**<sup>†</sup>. “Car crash detection using ensemble deep learning and multimodal data from dashboard cameras.” *Korea Safety Management & Science Fall Conference*, Ulsan, Republic of Korea, 2021.

Kim, Gyeongho, Jae Gyeong Choi, Minjoo Ku, Hyewon Cho, and **Sunghoon Lim**<sup>\*,†</sup>. “Developing a deep learning-based fault detection model for plastic injection molding for car parts companies.” *KSQM Spring Conference*, Seoul, Republic of Korea, 2021.

Kim, Sun Jun\*, and **Sunghoon Lim**<sup>†</sup>. “A deep learning-based hybrid recommender system with fake review filtering for e-commerce customers.” *KIIE Fall Conference*, Seoul, Republic of Korea, 2020.

Choi, Jae Gyeong\*, Chan Woo Kong, and **Sunghoon Lim**<sup>†</sup>. “Developing machine-learning-based car crash detection systems using video and audio data.” *KIIE Fall Conference*, Seoul, Republic of Korea, 2019.

Baek, DaeSeon, and **Sunghoon Lim**<sup>\*,†</sup>. “Smart farming: Developing growth programs and reforming environmental conditions for hog raising using machine vision and deep learning.” *KIIE/KORMS/KSS Joint Spring Conference*, Gwangju, Republic of Korea, 2019.

## Books

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Chatterjee, Sujoy, Thipendra P Singh, **Sunghoon Lim**, Anirban Mukhopadhyay. “Social Media and Crowdsourcing: Application and Analytics.” *CRC Press*, 2023.

김일중, 유승화, **임성훈**, 김홍남. “제조AI빅데이터 분석기법.” *보민출판사*, 2022.

## Columns

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**Lim, Sunghoon**. “AI and reformation of manufacturing cities, Pittsburgh and Ulsan (인공지능과 제조도시의 재도약, 피츠버그와 울산).” *UNIST Magazine 2021 Autumn*, 2021.

## Research Grants (Smart Manufacturing)

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Dec. 2023 – Aug. 2024 “Pan 온도 예측이 가능한 분포 추정 AI 알고리즘 연구”

(Principal Investigator), LG Electronics (LG전자).

Nov. 2023 – Apr. 2026 “소비재 상품산업, 공급망 관리 및 스마트 공장에서의 객체 인식을 위한 AI 혁신: 확산 기반 최적화 알고리즘과 확산 기반 생성 모델의 활용”

(Co-Principal Investigator), Ministry of Trade, Industry and Energy (산업통상자원부).

Sep. 2023 – Dec. 2023 “제조데이터 구매지원 사업” (Principal Investigator), Ministry of SMEs and Startups (중소벤처기업부).

- Jun. 2023 – May 2024 “인공지능(AI) 기반의 예지보전 및 생산 스케줄링 통합 최적화 연구” (Principle Investigator), Brain Pool (해외우수과학자유치사업), National Research Foundation of Korea (한국연구재단).
- May 2023 – Apr. 2024 “SCM 제품 할당 계획 수립 프로세스 자동화를 위한 AI/ML 기술 연구” (Principal Investigator), Samsung Electronics (삼성전자).
- Mar. 2023 – Sep. 2023 “IH 쿡탑의 스마트가열을 위한 온도 분포 추정 AI 모델 예측 정확도 향상” (Principal Investigator), LG Electronics (LG전자).
- Nov. 2022 – Jan. 2023 “연삭기계 데이터 활용한 AI 기반 품질 예측 모델 개발” (Principal Investigator), Samwon FA.
- Oct. 2022 – Nov. 2022 “연삭기계 데이터 활용한 AI 기반 가공 사이클 타임 최적 단축 모델 개발” (Principal Investigator), Samwon FA.
- Oct. 2022 – Apr. 2023 “AI/ML 기반 SCM 계획 수립 자동화” (Principal Investigator), Samsung Electronics (삼성전자).
- Oct. 2022 – Mar. 2023 “시계열 예측의 신뢰성 확보를 위한 분포 추정 인공지능 알고리즘 개발” (Principal Investigator), LG Electronics (LG전자).
- Jul. 2022 – Dec. 2022 “데이터인프라 제조 AI 데이터셋 구축” (Principal Investigator), Ministry of SMEs and Startups (중소벤처기업부).
- Jun. 2022 – May 2024 “제조 AI를 위한 설명가능한 멀티모달 딥러닝 알고리즘 개발 및 응용” (Principle Investigator), National Research Foundation of Korea (한국연구재단).
- May 2022 – Apr. 2023 “제조데이터 촉진자 양성” (Research Participant/Lecturer), Ministry of SMEs and Startups (중소벤처기업부).
- Apr. 2022 – Oct. 2022 “탄소중립을 위한 제조 AI: AI기반의 불량탐지와 불량원인분석 모델 개발” (Principal Investigator), Korea Foundation for Women In Science, Engineering and Technology (한국여성과학기술인육성재단).
- Jan. 2022 – Jul. 2022 “IH 쿡탑 비정상 조리 Scene 감지를 위한 인공지능 알고리즘 개발” (Principal Investigator), LG Electronics (LG전자).
- Nov. 2021 – May 2022 “가속수명시험 데이터를 이용한 AI 기반의 UV램프 수명예측모델 개발” (Principal Investigator), InterX.
- Sep. 2021 – Oct. 2021 “공정 데이터를 이용한 AI 기반의 UV램프 수명예측모델 개발” (Principal Investigator), InterX.
- Sep. 2021 – Dec. 2021 “자유목적 제조 AI 데이터셋 구축” (Principal Investigator), Ministry of SMEs and Startups (중소벤처기업부).
- Jun. 2021 – Feb. 2024 “Development of an AI-based fault prediction and cause analysis model for small-sized automobile parts companies (인공지능(AI)을 활용한 자동차 부품 중소기업의 불량예측 및 불량원인분석 모델 개발)” (Principle Investigator), National Research Foundation of Korea (한국연구재단).

- Nov. 2020 – Dec. 2020 “Logic development for simulation in shipbuilding (조선소 시뮬레이션을 위한 로직 알고리즘 개발)” (Co-Principal Investigator), Unity Technologies Korea.
- Oct. 2020 – Dec. 2020 “반복 동작으로 인한 근로자 부상 패턴 분석 및 재활프로그램 개발” (Co-Principal Investigator), Ulsan Industry University Convergence Institute (울산산학융합원).
- Sep. 2020 – Nov. 2020 “지정설비 제조 AI 데이터셋 구축” (Principal Investigator), Ministry of SMEs and Startups (중소벤처기업부).
- Sep. 2020 – Jan. 2021 “융착 공정 제조데이터 분석 및 AI 모델개발” (Principal Investigator), InterX.
- Jun. 2020 – Nov. 2020 “제조데이터 분석 및 AI 모델개발” (Co-Principal Investigator), InterX.
- Apr. 2020 – Aug. 2020 “제조업 근로자 부상 방지를 위한 인공지능 기반 알고리즘 개발” (Co-Principal Investigator), Ulsan Industry University Convergence Institute (울산산학융합원).
- Jun. 2019 – Feb. 2022 “Development of an automated system using machine learning and commercial sensors for identifying whether manufacturing workers wear protective gear (기계학습 및 상용센서 기반의 제조업 근로자들의 보호장비 착용여부 확인 자동화 시스템 개발)” (Principle Investigator), National Research Foundation of Korea (한국연구재단).
- Nov. 2018 – Oct. 2021 “A Study on Trend Analysis of Customers and Competitors for the Enhancement of the Competitiveness of Local Manufacturers in Industry 4.0: Trend Analysis Model Development Based on Unstructured Big Data Analysis and Artificial Intelligence (AI) (Industry 4.0 환경에서의 국내 제조기업 경쟁력 강화를 위한 고객/경쟁사 동향분석 연구: 비정형 빅데이터분석 및 인공지능(AI)을 기반으로 한 동향분석모델 개발)” (Principle Investigator), Ulsan National Institute of Science and Technology (UNIST).

### **Research Grants (Other Application Areas)**

- Apr. 2022 – Dec. 2025 “50% Accident Prevention Focus to reduce accident rate Development of Risk Detection System for Road Facilities Based on Artificial Intelligence (50% 사고율 감소를 위한 사고 예방 중심 인공지능 기반 도로시설 위험탐지 시스템 개발)” (Co-Principal Investigator), Advanced Technology Center (ATC+, 우수기업연구소육성사업), Ministry of Trade, Industry and Energy (산업통상자원부).
- Oct. 2021 – Mar. 2023 “Route optimization for wheelchair users (휠체어 사용자를 위한 경로 최적화)” (Co-Principal Investigator), The Commercializations Promotion Agency for R&D Outcomes (과학기술일자리진흥원).
- Apr. 2021 – Mar. 2022 “3D Pose Estimation Motion Data Development based on the Fusion of 3D Data and AI (3D 데이터와 AI의 기술융합을 기반한 3D Pose Estimation Motion Data 개발)” (Co-Principle Investigator), Institute of Information & communications Technology Planning & evaluation (IITP, 정보통신기획평가원).



- Mar. 2021 – Feb. 2023 “Improvement of input accuracy and convenience on VR/AR using AI and wearable soft sensors (AI와 웨어러블 소프트 센서 시스템을 이용한 VR/AR에서의 입력 정확성/편의성 향상)” (Principle Investigator), Ulsan National Institute of Science and Technology (UNIST) & Feel the Same.
- Feb. 2021 – Dec. 2021 “인공지능(AI) 기반의 질환 발병 예측모델 개발 및 생체나이 계산” (Principal Investigator), U2medtek.
- Jul. 2019 – Dec. 2019 “Curriculum development for students in smart port logistics (빅데이터 분석 기반의 항만물류 융합인재 양성을 위한 표준 커리큘럼 개발)” (Principle Investigator), UNIST-Ulsan Port Authority Smart Port Logistics Data Center (스마트항만물류지원센터).
- May 2019 – Dec. 2019 “Development of a machine learning model to predict liquid cargo traffic and demands for storage facilities using port logistics big data (항만물류 빅데이터를 이용한 울산항 액체화물의 종류별 물동량 예측 및 탱크저장시설 수요 예측을 위한 기계학습모델 개발)” (Principle Investigator), UNIST-Ulsan Port Authority Smart Port Logistics Data Center (스마트항만물류지원센터).

## **Technical Advisement**

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- Aug. 2023 – Sep. 2023 “세계경제포럼(WEF)의 글로벌 등대공장에 관한 기술자문”, (주)아모레퍼시픽
- Aug. 2023 – Mar. 2024 “인공지능과 스마트제조에 관한 기술자문”, (주)ABH
- May 2023 – May 2024 “중근당 메타버스 팩토리에 관한 기술자문”, (주)임픽스
- Dec. 2021 – Feb. 2022 “인공지능 기반의 평가모델 및 추천시스템 개발에 관한 기술자문”, (주)맘편한세상

## **Patents**

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Kweon, Sang Jin, **Sunghoon Lim**, Dagyoo Kweon, Taeyeop Kang, Soyeon Park, Jiyeong Min, and Yujin Song. “터널 내에서 CCTV를 활용한 실시간 차량의 후면 번호판 인식 및 차선 변경 차량 감지.” Pending, 2023.

**Lim, Sunghoon**, Sujin Jeon, Soyeon Park, and Joonbum Bae. “Static and dynamic gesture recognition device using a soft sensor embedded glove and method thereof (소프트 센서가 부착된 장갑을 이용한 정적 및 동적 제스처 인식 장치 및 방법).” Pending, 2023.

**Lim, Sunghoon**, Jae Gyeong Choi, Sun Jun Kim, and Minjoo Ku. “SYSTEM AND METHOD FOR ESTIMATING THREE-DIMENSIONAL POSE USING VISIBILITY SCORE (가시성 지표를 활용한 3차원 포즈 추정 시스템 및 방법).” Pending, 2022.

Kweon, Sang Jin, Yong Ung Kwon, and **Sunghoon Lim**. “DEVICE AND METHOD TO PREDICT MUSCLE INJURY DURING REPEATITIVE WORKING ACTIVITY OF WORKER (근로자의 반복적인 근무 활동 동안 근육 부상을 예측하는 방법 및 장치).” 10-2485242.

Kweon, Sang Jin, Yong Ung Kwon, and **Sunghoon Lim**. “METHOD AND DEVICE FOR REHABILITATION TO PREVENT INJURIES DUE TO REPEATED ROTATION MOTION (반복 회전동작으로 인한 부상 방지 재활

방법 및 부상 방지 재활 장치).” 10-2413185.

## Honors and Awards

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- Apr. 2024 Excellence Award (Industry-Academia Cooperation), **Outstanding Faculty Award**, UNIST
- Aug. 2017 **Design Education (DEC) Technical Committee Best Paper Award (\$1,000)**, *ASME 2017 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference*

## Invited Talks

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- Lim, Sunghoon.** “스마트제조 의 현재와 미래, 그리고 AI.” *Special Seminar*, AMORE Beauty Park, Republic of Korea, 2024.
- Lim, Sunghoon.** “Challenges in research on smart manufacturing.” *IME Seminar*, The Department of Industrial and Management Engineering, Pohang University of Science and Technology (POSTECH), Republic of Korea, 2024.
- Lim, Sunghoon.** “Improvement of input accuracy and convenience on VR/AR using AI and wearable soft sensors.” *UNIST AI Innovation Day*, Ulsan National Institute of Science and Technology (UNIST), Republic of Korea, 2023.
- Lim, Sunghoon.** “The Present and Future of Smart Manufacturing and Ulsan AM HUB.”, *Global Manufacturing Innovation Forum 2023 (글로벌 제조 혁신 포럼 2023)*, Republic of Korea, 2023.
- Lim, Sunghoon.** “중소기업 스마트제조 의 현재와 미래, 그리고 AI.” *BUTECH 2023 (제11회 부산국제기계대전)*, BEXCO, Republic of Korea, 2023.
- Lim, Sunghoon.** “Improvement of input accuracy and convenience on VR/AR using AI and wearable soft sensors.” *UNIST AI Innovation Day*, Ulsan National Institute of Science and Technology (UNIST), Republic of Korea, 2022.
- Lim, Sunghoon.** “스마트제조 의 현재와 미래, 그리고 AI.” *2022 가족회사 네트워크 및 지역산업 발전 세미나*, University of Ulsan, Republic of Korea, 2022.
- Lim, Sunghoon.** “중소기업 스마트제조 의 현재와 미래, 그리고 AI.” *SMATEC 2022 (제4회 스마트공장구축 및 생산자동화전)*, Suwon Convention Center, Republic of Korea, 2022.
- Lim, Sunghoon.** “울산의 제조혁신 방향과 과제.”, *제3회 경남 디지털혁신 융합 포럼*, Gyeongsang National University, Republic of Korea, 2022.
- Lim, Sunghoon.** “Directions and strategies for advanced manufacturing in Ulsan (울산의 제조혁신 방향과 과제).”, *2021 Ulsan Advanced Manufacturing (AM) Hub Forum (울산 글로벌 제조혁신 포럼)*, Republic of Korea, 2021.
- Lim, Sunghoon.** “Pose Estimation을 위한 AI Algorithm 소개.” *2021년 인공지능 연계 콘텐츠 창의인재 양성사업 오픈특강*, (주)케이넷이엔지, Republic of Korea, 2021.
- Lim, Sunghoon.** “Improvement of input accuracy and convenience on VR/AR using AI and wearable soft sensors.” *UNIST AI Innovation Day*, Ulsan National Institute of Science and Technology (UNIST), Republic of Korea, 2021.
- Lim, Sunghoon.** “Improvement of input accuracy and convenience on VR/AR using AI and wearable soft sensors.”

*UNIST AI Technology Open Workshop*, Ulsan National Institute of Science and Technology (UNIST), Republic of Korea, 2021.

**Lim, Sunghoon.** “Dependent and Constrained Judgement Analysis for Crowdsourcing.” *KU-IAI Expert Seminar*, The School of Industrial Management Engineering, Korea University, Republic of Korea, 2021.

**Lim, Sunghoon.** “Dependent and Constrained Judgement Analysis for Crowdsourcing.” *IBS Data Science Talk Series*, IBS Data Science Group, Institute for Basic Science (IBS), Republic of Korea, 2020.

**Lim, Sunghoon.** “A Bottom-Up Machine Learning Model for Real-Time Population Health Management Using Social Media Data.” *Special Seminar*, The Department of Industrial and Management Engineering, Pohang University of Science and Technology (POSTECH), Republic of Korea, 2017.

**Lim, Sunghoon.** “Clustering-based Real-time Population Health Management Using Online User-generated Data.” *IE 590: Industrial Engineering Colloquium*, The Pennsylvania State University, University Park, Pennsylvania, 2017.

## **Teaching Experience**

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### **Ulsan National Institute of Science and Technology (UNIST)**

**Instructor:** *UNI108 Industrial Engineering Relay Seminar* (Fall 2020)

*IE201 Operations Research I* (Fall 2018)

*IE406 Applied Machine Learning* (Spring 2019, Spring 2020, Spring 2021, Spring 2022, Spring 2023, Spring 2024)

*IE422 Social Network Analysis* (Fall 2019, Fall 2020, Fall 2021, Fall 2022)

*IE450 Project Lab* (Spring 2020, Spring 2021)

*MGE551 Special Topics in ME I (Machine Learning: Real-world Applications)* (Spring 2019)

*IE510/AI602 Smart Factory and Advanced Manufacturing* (Fall 2023)

\* All courses were taught in English.

## **Professional Services**

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<b>Committee Member</b>	국가전략기술 첨단로봇·제조 조정위원회 (중점기술: 가상제조) (Nov. 2023 – Present)
<b>Committee Member</b>	중소벤처기업부(Ministry of SMEs and Startups) AI 제조데이터 전략위원회 위원 (Jun. 2021 – May 2022)
<b>Committee Chair</b>	중소벤처기업부(Ministry of SMEs and Startups) 서비스분과위원회 위원장 (Jun. 2021 – May 2022)
<b>Steering Committee Member</b>	Advanced Manufacturing Hub (AM Hub), The World Economic Forum (Jun. 2021 – Present)
<b>Director</b>	Ulsan Advanced Manufacturing Hub (AM Hub), The World Economic Forum (Jun. 2021 – Present)

**Professional Societies and Activities**

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<b>Board Member</b>	Korea Data Mining Society (한국데이터마이닝학회)
<b>Committee Chair</b>	K-인공지능 제조데이터 분석 경진대회, 중소벤처기업부(Ministry of SMEs and Startups) (2023)
<b>Committee Member</b>	K-인공지능 제조데이터 분석 경진대회, 중소벤처기업부(Ministry of SMEs and Startups) (2021, 2022)
<b>Forum Host</b>	Ulsan Advanced Manufacturing (AM) Hub Forum (울산 글로벌 제조혁신 포럼), Ulsan Metropolitan City (2021, 2022)
<b>Forum Session Chair</b>	2022 Ulsan Forum (2022 울산포럼), SK Group (2022)
<b>Panel</b>	Smart Manufacturing Forum (스마트 제조 포럼), Apple Manufacturing R&D Accelerator (2023)

**Work Experience**

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Feb. 2009 – Jul. 2012	Defense Agency for Technology and Quality, Seoul, Republic of Korea Researcher in the Reliability Analysis Team
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