

## Sunghoon Lim, Ph.D.

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### **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* (In Press)

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>. “Accurate synthesis of sensor-to-machined-surface image generation in carbon fiber-reinforced plastic drilling.” *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>. “Sensor to Machined Surface Image Generation in CFRP Drilling.” *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\*, Sang Min Yang, Sinwon Kim, Dong Min Kim, **Sunghoon Lim**†, Hyung Wook Park†. “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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Apr. 2024 – Mar. 2027 “Development of large multimodal model (LMM)-based image generation techniques for machining surface quality prediction in drilling processes for carbon neutrality (탄소중립을 위한 드릴링 공정 결함 예측용 대규모 멀티모달 모델(LMM) 기반의 가공면 이미지 생성 AI 기술 개발)” (Principle Investigator), 우수신진연구, The National Research Foundation of Korea (한국연구재단).

- 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), 기본연구, 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), 기본연구, 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)**

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- 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**. "스마트제조와 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 스마트제조와 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**. "스마트제조와 미래, 그리고 AI." *2022 가족회사 네트워크 및 지역산업 발전 세미나*, University of Ulsan, Republic of Korea, 2022.

**Lim, Sunghoon**. "중소기업 스마트제조와 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.



	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, 중소기업부(Ministry of SMEs and Startups) (2023)
<b>Committee Member</b>	K-인공지능 제조데이터 분석 경진대회, 중소기업부(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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