Kimin Yun

Contact Information

Visual Intelligence Research Section
Artificial Intelligence Research Laboratory
Electronics and Telecommunications Research Institute (ETRI)
218 Gajeong-ro, Yuseong-gu, Daejeon, 34129, South Korea

Webpage: https://kimin-yun.github.io
Google Scholar: Link
E-mail: kimin.yun@etri.re.kr

Citizenship

Republic of Korea

Research Interests

Computer Vision, Pattern recognition, Machine learning, Visual event analysis

Career

Electronics and Telecommunications Research Institute (ETRI)

Senoir Researcher, March, 2019

Researcher, Feburary, 2017

Education

Seoul National University, Seoul, Korea

Ph.D., Department of Electrical and Computer Engineering, Feburary, 2017

- Thesis Title: *Background-Centric Approach for Moving Object Detection in Moving Cameras*
- Adviser: Prof. Jin Young Choi
- Area of Study: Machine Learning and its application to computer vision area

B.S., Department of Electrical Engineering, Feburary, 2010

- Thesis Title: *Video Stabilization System for Real-time Video Surveillance System*
- Graduated Cum Laude

Journal Publications

Kimin Yun, Hyung-Il Kim, Kangmin Bae, and Jinyoung Moon, "Background memory-assisted zero-shot video object segmentation for unmanned aerial and ground vehicles", *ETRI Journal*, 2023.

Hyung-Il Kim, **Kimin Yun**, and Yong Man Ro, "Face Shape-Guided Deep Feature Alignment for Face Recognition Robust to Face Misalignment", *IEEE Transactions on Biometrics, Behavior, and Identity Science*, 2022.

Geonu Lee, **Kimin Yun**, and Jungchan Cho, "Occluded Pedestrian-Attribute Recognition for Video Sensors Using Group Sparsity", *Sensors*, 2022.

Hyundong Jin, **Kimin Yun**, and Eunwoo Kim, "Gating Mechanism in Deep Neural Networks for Resource-Efficient Continual Learning", *IEEE Access*, 2022.

Kimin Yun, and Jongwon Choi, "Adaptive Network Compression using Block Removal and Recycling Mechanisms", *Techart: Journal of Arts and Imaging Science*, 2021.

Youngwan Lee, Hyung-Il Kim, **Kimin Yun**, and Jinyoung Moon, "Diverse Temporal Aggregation and Depthwise Spatiotemporal Factorization for Efficient Video Classification", *IEEE Access*, 2021.

Geonu Lee, **Kimin Yun**, and Jungchan Cho, "Improved Human-Object Interaction Detection through On-the-Fly Stacked Generalization", *IEEE Access*, 2021.

Kimin Yun, Jongyoul Park, and Jungchan Cho, "Robust Human Pose Estimation for Rotation via Self-Supervised Learning", *IEEE Access*, 2020.

Kimin Yun, Yongjin Kwon, Sungchan Oh, Jinyoung Moon, and Jongyoul Park, "Vision-based Garbage Dumping Action Detection for Real-World Surveillance Platform", *ETRI Journal*, 2019. (Best Paper Award)

Sangdoo Yun, Jongwon Choi, Youngjoon Yoo, **Kimin Yun**, and Jin Young Choi "Action-Driven Visual Object Tracking with Deep Reinforcement Learning", *IEEE Transactions on Neural Networks and Learning Systems (TNNLS)*, 2018.

Kimin Yun, Jongin Lim, and Jin Young Choi, "Scene Conditional Background Update for Moving Object Detection in a Moving Camera", *Pattern Recognition Letters*, 2017.

Kimin Yun, YoungJoon Yoo, and Jin Young Choi, "Motion Interaction Field for Detection of Abnormal Interactions", *Machine Vision and Applications*, 2017.

Soo Wan Kim, Shimin Yin, **Kimin Yun**, and Jin Young Choi, "Spatio-temporal weighting in local patches for direct estimation of camera motion in video stabilization", *Computer Vision and Image Understanding*, Vol.118, pp.71-83, Jan 2014.

Soo Wan Kim, **Kimin Yun**, Kwang Moo Yi, Sun Jung Kim and Jin Young Choi, "Detection of moving objects with a moving camera using non-panoramic background model", *Machine Vision and Applications*, pages 1015-1028, Vol.24, Issue 5, July 2013.

International Conference Publications

Hyung-Il Kim*, **Kimin Yun*** Jun-Seok Yun, and Yuseok Bae, "Task-Specific Adaptation of Segmentation Foundation Model via Prompt Learning", *European Conference on Computer Vision Workshop on Out Of Distribution Generalization in Computer Vision (**ECCVW**)*, 2024. * equal contribution

Kimin Yun*, Jeonghoon Song, and Yuseok Bae, "Training-Free OOD Object Detection Leveraging Pre-trained Segmentation Model Competency", *The 15th International Conference on ICT Convergence (ICTC)*, 2024. * equal contribution

Sunoh Kim, Taegil Ha, **Kimin Yun**, and Jin Young Choi, "SWAG-Net: Semantic Word-Aware Graph Network for Temporal Video Grounding", *ACM International Conference on Information and Knowledge Management (**CIKM**)*, 2022.

Youngwan Lee, Joong-Won Hwang, Hyung-Il Kim, **Kimin Yun**, Yongjin Kwon, Yuseok Bae, and Sung Ju Hwang, "Localization Uncertainty Estimation for Anchor-Free Object Detection", *European Conference on Computer Vision Workoshop on Uncertainty Quantification for Computer Vision (**ECCVW**)*, 2022.

Kangmin Bae*, **Kimin Yun***, Jungchan Cho, and Yuseok Bae "The Dataset and Baseline Models to Detect Human Postural States Robustly against Irregular Postures", *IEEE Int'l Conf on Advanced Video and Signal-based Surveillance (**AVSS**)*, 2021. * equal contribution

Sunoh Kim, **Kimin Yun**, and Jin Young Choi, "Position-aware Location Regression Network for Temporal Video Grounding", *IEEE Int'l Conf on Advanced Video and Signal-based Surveillance (**AVSS**)*, 2021.

Kimin Yun, Hyungil Kim, Kangmin Bae, and Jongyoul Park "Unsupervised Moving Object Detection through Background Models for PTZ Camera", *International Conference on Pattern Recognition (**ICPR**)*, 2020.

Kangmin Bae*, **Kimin Yun***, Hyungil Kim, Youngwan Lee, and Jongyoul Park "Anti-Litter Surveillance based on Person Understanding via Multi-task Learning", *British Machine Vision Conference (**BMVC**)*, 2020. * equal contribution

Sunoh Kim, **Kimin Yun**, Jongyoul Park, and Jin Young Choi "Skeleton-based Action Recognition of People Handling Objects", *IEEE Winter Conference on Applications of Computer Vision (**WACV**)*, 2019.

Jeong-Min Seo, Haanju Yoo, **Kimin Yun**, Hyunil Kim, and Sang-Il Choi "Behavior Recognition of a Person in a Daily Video Using Joint Position Information", *IEEE International Conference on Artificial Intelligence and Knowledge Engineering Workshop on AI Bigdata Cloud Technologies*, 2018.

Sangdoo Yun, Jongwon Choi, Youngjoon Yoo, **Kimin Yun**, and Jin Young Choi, "Action-Decision Network for Visual Tracking with Deep Reinforcement Learning", *IEEE International Conference on Computer Vision and Pattern Recognition (**CVPR**)*, 2017.

Byeongho Heo, **Kimin Yun** and Jin Young Choi, "Appearance and Motion based Deep Learning Architecture for Moving Object Detection in Moving Camera", *IEEE International Conference on Image Processing (**ICIP**)*, 2017.

Kimin Yun, Jongin Lim, Sangdoo Yun, Soo Wan Kim, and Jin Young Choi, "Attention-Inspired Moving Object Detection in Monocular Dashcam Videos", *23rd International Conference on Pattern Recognition (**ICPR**)*, 2016.

Sangdoo Yun, **Kimin Yun**, Jongwon Choi, and Jin Young Choi, "Density-Aware Pedestrian Proposal Networks for Robust People Detection in Crowded Scenes", *International Workshop on Crowd Understanding in conjuction with ECCV (**ECCVW**)*, 2016.

YoungJoon Yoo, **Kimin Yun**, Sangdoo Yun, JongHee Hong, Hawook Jeong, and Jin Young Choi, "Visual Path Prediction in Complex Scenes with Crowded Moving Objects", *IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**)*, 2016.

Kimin Yun and Jin Young Choi, "Robust and Fast Moving Object Detection in a Non-Stationary Camera via Foreground Probability based Sampling", *IEEE International Conference on Image Processing (**ICIP**)*, 2015.

ByeongJu Lee, Jongwon Choi, **Kimin Yun**, and Jin Young Choi, "Gradient Preserving RGB-to-Gray Conversion using Random Forest", *IEEE International Conference on Image Processing (**ICIP**)*, 2015.

ByeongJu Lee, **Kimin Yun**, Jongwon Choi, and Jin Young Choi, "Robust Pan-Tilt-Zoom Tracking via Optimization Combining Motion Features and Appearance Correlations "', *IEEE International Conf. on Advanced Video and Signal based Surveillance (**AVSS**)*, 2015.

Kimin Yun, Jiyun Kim, Soo Wan Kim, Hawook Jeong, and Jin Young Choi, "Learning with Adaptive Rate for Online Detection of Unusual Appearance", *10th International Symposium on Visual Computing (**ISVC**)*, 2014.

Tushar Sandhan, **Kimin Yun**, and Jin Young Choi, "Proximity Clustering for Revealing a Semantically Dominant Class", *10th International Symposium on Visual Computing (**ISVC**)*, 2014.

Kimin Yun, Hawook Jeong, Kwang Moo Yi, Soo Wan Kim, and Jin Young Choi, "Motion Interaction Field for Accident Detection in Traffic Surveillance Video", *22nd International Conference on Pattern Recognition (**ICPR**)*, 2014.

Sangdoo Yun, **Kimin Yun**, Soo Wan Kim, Youngjoon Yoo and Jiyeoup Jeong. "Visual Surveillance Briefing System: Event-based Video Retrieval and Summarization", *IEEE International Conf. on Advanced Video and Signal based Surveillance (**AVSS**)*, 2014.

Kwang Moo Yi, **Kimin Yun**, Soo Wan Kim, Hyung Jin Chang, Hawook Jeong, and Jin Young Choi, "Detection of Moving Objects with Non-Stationary Cameras in 5.8ms: Bringing Motion Detection to your Mobile Device", *IEEE Int. workshop on Mobile vision, in conjunction with CVPR (**CVPRW**)*, 2013. (Best Paper Award)

Kimin Yun, Soo Wan Kim, and Jin Young Choi, "Probabilistic Approach with Three Hierarchies of Motion Estimation for Video Stabilization", *IEEE Digital Image Computing: Techniques and Applications (**DICTA**)*, 2011.

Domestic Conference Publications

송정훈, **윤기민**, 배유석, "Anomalous Object Detection in Road Scenes based on Out-of-Distribution object Characteristics", 인공지능 신호처리 학술대회, 2024

조재호, 배유석, 천용석, **윤기민**, "Fine-tuning Open-Set Detectors through Self-Supervised Learning and Data Selection Strategies: A Case Study in Banner Detection", 한국컴퓨터 종합 학술대회, 2024

부원국, 배강민, **윤기민**, 배유석, "Development of Real-world Fallen Person Detection using Multi-task Learning", 대한전자공학회 학술 대회 (하계), 2023

송길재, 김진아, 배강민, **윤기민**, 배유석, "A Framework for Effective Multi-camera Batch Inference and Event Alert", 한국컴퓨터 종합 학술대회, 2022

김진아, 송길재, 배강민, **윤기민**, 배유석, "Improvements on Real-world Domain and Person Understanding via Optimal Combination of Training Dataset and Model", 한국컴퓨터 종합 학술대회, 2022

윤기민, 박종열, "동적 카메라 동적 물체 탐지를 위한 세밀 배경 학습법", *제27회 영상처리 및 이해에 관한 워크샵 (**IPIU**)*, 2019.

서정민, 유한주, 최상일, **윤기민**, "행동 이해용 학습데이터 생성을 위한 어노테이션 도구 개발", 2018년도 한국통신학회 하계종합학술대회, 2018.

허병호, **윤기민**, 정지엽, 최진영, "외형 및 움직임 정보를 활용한 딥 러닝 기반의 동적 카메라 동적 물체 탐지 기술 ", *제27회 영상처리 및 이해에 관한 워크샵 (**IPIU**)*, 2017.

정지엽, 최종원, 이병주, **윤기민**, 최진영, "가우시안 프로세스 회기 함수를 이용한 환경변화에 강인한 군중밀도 감지 알고리즘 개발", *제27회 영상처리 및 이해에 관한 워크샵 (**IPIU**)*, 2015.

윤기민, 윤상두, 최진영, "움직임 상호 작용 모델을 통한 군중 폭력 상황 감지", *대한전자공학회 하계종합학술대회*, 2015.

윤기민, 유영준, 김지윤, 최진영, "실시간 자동 감시를 위한 비정상 이벤트 검출 통합 플랫폼", *제 15회 전자정보통신 학술대회 (**CEIC**)*, 2013.

윤기민, 김수완, 윤상두, 김지윤, 최진영, "감시 영상의 사후 분석을 위한 이벤트 요약 및 분석 애니메이션 기술"', *대한전자공학회 정기총회 및 추계학술대회*, 2012.

윤기민, 김수완, 최진영, "국부움직임의 확률적 정의를 통한 계층적인 영상안정화 기술", *제24회 영상처리 및 이해에 관한 워크샵 (**IPIU**)*, 2012.

김수완, 윤석민, **윤기민**, 최진영, "광역 가중 LKT 방법을 이용한 비디오 안정화 기법", *정보 및 제어 학술대회 (**CICS**)*, 2011.

윤기민, 김수완, 최진영, "적분 투영 이미지와 쏠림 현상 지표를 이용한 안정적인 비디오 안정화 기술", *대한전자공학회 정기총회 및 추계학술대회*, 2010.

김수완, **윤기민**, 이현진, 최진영, "비디오 안정화를 위한 bit-plane 상에서의 강인한 국소 패치 매칭 기법", *대한전자공학회 하계종합학술대회*, 2010.

Patents

US Patent 16/834500, Domain adaptation-based object recognition apparatus and method (October, 2020, pending)

US Patent US10789470B2, System and method for detecting dynamic object (September, 2020, granted)

US Patent US10311579B2, Apparatus and method for detecting foreground in image (June, 2019, granted)

US Patent 16/541639, Smart glasses and method of selectively tracking target of visual cognition (August, 2019, pending)

US Patent 16/401789, Method and apparatus for detecting a garbage dumping action in real time on video surveillance system (May, 2019, pending)

US Patent 16/033152, SYSTEM AND METHOD FOR DETECTING DYNAMIC OBJECT (July, 2018, pending)

US Patent US9418320 B2, Apparatus and method for detecting object using PTZ camera (August, 2016, granted)

KOR Patent 10-2016-0008335 영상에서의 전경 검출 및 방법 (January, 2016, pending)

KOR Patent 1015134140000 감시 영상 분석 방법 및 시스템 (April, 2015, granted)

KOR Patent 1014384510000 비고정 카메라 영상에 대한 이중모드 SGM 기반의 이동체 고속 검출 방법 및 이를 위한 컴퓨터로 판독가능한 기록 매체 (September, 2014, granted)

KOR Patent 1012992370000 팬틸트줌 카메라를 이용한 물체 탐지 장치 및 방법 (August, 2013, granted)

Awards and Honors

2023년 국가연구개발 우수성과 100선 (National R&D Excellence Top 100, Minister of Science and ICT, South Korea), 참여연구원 **2023**

다양한 환경에 적용가능한 영상 이해 인공지능 핵심기술 개발과 시민 안전 분야 실증 및 사업화

- Project Leader: 배유석 (Yuseok Bae)

2023년 대한민국 재난안전 연구개발 행정안전부 장관상 (National Disaster Management R&D Award, Ministry of the Interior and Safety, South Korea), 참여연구원 **2023**

영상 이해 인공지능 핵심기술을 통한 공공 CCTV 활용 시민 안전 실증 및 사업화

- Project Leader: 배유석 (Yuseok Bae)

ETRI 우수연구실적상, ETRI 저널 논문 부문

2021년 국가연구개발 우수성과 100선 (National R&D Excellence Top 100, Minister of Science and ICT, South Korea), 참여연구원 **2021**

사람의 행동을 정밀하게 이해하는 시각지능 핵심 원천 기술 확보 및 실세계 적용 응용 기술 개발

- Project Leader: 배유석 (Yuseok Bae)

Best Paper Award, ETRI Journal, **2020**

Vision-based Garbage Dumping Action Detection for Real-World Surveillance Platform

- 주저자 (1저자)

ETRI 대표성과 (Representative Research) - 대상(Grand Prize), 참여연구원 **2020**

영상 내용을 사람처럼 이해하는 시각지능 원천 기술

- Project Leader: 박종열 (Jongyoul Park)

2019년 국가연구개발 우수성과 100선 (National R&D Excellence Top 100, Minister of Science and ICT, South Korea), 참여연구원 **2019**

대규모 시각 데이터 실시간 분석 및 내용 이해를 위한 디스커버리 플랫폼 (DeepView: 딥뷰) 개발

- Project Leader: 박종열 (Jongyoul Park)

ETRI 신입직원상 (New Employee Award), **2019**

Best Paper Award, CVPR workshop, **2013**

Detection of Moving Objects with Non-Stationary Cameras in 5.8ms:Bringing Motion Detection to your Mobile Device

- Workshop on Mobile vision in conjunction with CVPR
- 공동저자 (2저자)

송원김영환장학재단 장학생 (Songwon KimYoungHwan Scholarship), **2006–2013**

서울대학교 전기공학부 장학생, **2006**

Teaching Experience

ETRI AI Academy, Daejeon, Korea

전문교수 (Professor)

- Human Pose and its Application **Aug. 2020 to now**

Dankook University, Yongin, Korea

Guest Lecturer (6 week)

- Machine Vision **April. 2016 to June. 2016**

Seoul National University, Seoul, Korea

Teaching Assistant

- Convex Optimization **Sep. 2012 to Dec. 2012**
- Introduction to Random Variables and Random Processes **Mar. 2012 to Jun. 2012**

Research Project Experience

Development of Artificial Intelligence Technology for Self-Improving Competency-Aware Learning Capabilities **Mar. 2024 to now**

- This work was supported by Institute of Information & Communications Technology Planning & Evaluation (IITP) grant funded by the Korea government (MSIT).

Development of High Performance Visual BigData Discovery Platform for Large-Scale Realtime Data Analysis **Feb. 2017 to Feb. 2024**

- This work was supported by Institute of Information & Communications Technology Planning & Evaluation (IITP) grant funded by the Korea government (MSIT).

Development of Previsional Intelligence based on Long-term Visual Memory Network **Jan. 2020 to Feb. 2022**

- This work was supported by Institute of Information & Communications Technology Planning & Evaluation (IITP) grant funded by the Korea government (MSIT).

Deep Learning based Object detection and Recognition **Apr. 2015 to Feb. 2016**

- Sponsored by the SAIT Samsung Electronics. The goal of the project is developing detection and recognition algorithms in a driver's view.

Development of Predictive Visual Intelligence Technology **Apr. 2014 to Feb. 2016**

- Sponsored by the ICT R&D program of MSIP/IITP. The goal of the project is developing predicting algorithms such as traffic flows.

UAV Visual Surveillance System **Apr. 2013 to Feb. 2015**

- Sponsored by Samsung S1. The goal of the project is developing visual surveillance algorithms for unmanned aerial videos such as moving object detection in a non-stationary camera.

Intelligent Visual Surveillance System **Mar. 2010 to Aug. 2013**

- Sponsored by Samsung Techwin Co., Ltd. The goal of the project is developing visual analysis algorithms, such as background subtraction, object tracking and behavior understanding, and integrated system.

Reviewers

IEEE Transactions on Neural Networks and Learning Systems
IEEE Transactions on Image Processing
IEEE Transactions on Vehicular Technology
IEEE Transactions on Multimedia
IEEE Access

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