

Pilhyeon Lee

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CONTACT INFORMATION

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RESEARCH INTEREST

Computer Vision, Deep Learning
Video Understanding
Weakly-supervised Learning

EDUCATION

Ph.D. Student, Dept. of Computer Science, Mar. 2018 - Present
Yonsei University, Seoul, South Korea
Supervised by Prof. Hyeran Byun
B.S. Dept. of Computer Science and Engineering, Mar. 2014 - Feb. 2018
Chung-Ang University, Seoul, South Korea
Honors: *Magna cum laude* (GPA: 4.18/4.5)

PUBLICATION

INTERNATIONAL CONFERENCE

1. **Pilhyeon Lee**, Jinglu Wang, Yan Lu, and Hyeran Byun. "Background Modeling via Uncertainty Estimation for Weakly-supervised Action Localization", *In 35th AAAI Conference on Artificial Intelligence (AAAI)*, Feb. 2021. (**Oral Presentation**) (**21.0** % acceptance rate)
2. Sunhee Hwang*, Sungho Park*, **Pilhyeon Lee***, Seokgyu Jeon, Dohyung Kim, and Hyeran Byun. "Exploiting Transferable Knowledge for Fairness-aware Image Classification", *In 15th Asian Conference on Computer Vision (ACCV)*, Nov. 2020. (* equal contributions)
3. **Pilhyeon Lee**, Youngjung Uh, and Hyeran Byun. "Background Suppression Network for Weakly-supervised Temporal Action Localization", *In 34th AAAI Conference on Artificial Intelligence (AAAI)*, Feb. 2020. (**Spotlight Presentation**) (**20.6** % acceptance rate)

DOMESTIC

Conference: 3 papers (in Korean)

RESEARCH EXPERIENCE

- Dept. of Computer Science, Yonsei University** Mar. 2018 - Present
Advised by Prof. Hyeran Byun
(Researcher)
- **Study on Audio, Video, 3d Map and Activation Map Generation System using Deep Generative Model**
 - Jul. 2019 - Dec. 2020
 - Funded by Institute of Information & Communication Technology (IITP)
 - Developed a method to generate more precise temporal class activation map from untrimmed videos.
 - **Fundamental Study of Vision Algorithms for Comprehensive and Thorough Understanding of Videos**
 - Aug. 2017 - Dec. 2020
 - Funded by Ministry of Science, ICT and Future Planning
 - Assisted research on fully-supervised temporal action localization.
 - Developed a new framework for weakly-supervised temporal action localization.
 - The work for the weakly-supervised setting was summarized in a paper and accepted to AAAI 2020.
 - **Development of Long-range and Multi-person Tracking Method**
 - May. 2020 - Nov. 2020
 - Funded by Samsung Electronics Co., Ltd.
 - Enhanced 2D pose estimation results in complex scenes.
 - Developed a framework for action recognition based on pose and RGB streams.

- **Deep Learning based Object Detection for Image Analysis**

- May. 2018 - Dec. 2018
- Funded by Samsung Electronics Co., Ltd.
- Created a dataset for object detection task.
- Experimented with state-of-the-art object detection methods.

Media Computing Group, Microsoft Research Asia

Dec. 2019 – Jun. 2020

Working with Dr. Yan Lu and Dr. Jinglu Wang
(Research Intern)

- **Background Modeling for Weakly-supervised Temporal Action Localization**

- Dec. 2019 – Jun. 2020
- Proposed a new background modeling approach and an end-to-end framework for weakly-supervised temporal action localization.
- This work was summarized in a paper and accepted to AAAI 2021.

**Dept. of Computer Science and Engineering,
Chung-Ang University**

Jun. 2017 - Feb. 2018

Advised by Prof. Jaesung Lee
(Research Intern)

- **Inter-cultural Korean Music Discovery based on Pluralistic Music Emotion**

- June. 2016 – May. 2019
- Funded by Ministry of Science, ICT and Future Planning
- Established a multi-label music dataset.
- Assisted research on improving classification performance on multi-label data via instance selection algorithm.

AWARDS

Best Paper Award from Microsoft Research, The 3rd Joint Conference of Korean Artificial Intelligence Association 2020
Graduation Honors Award, Chung-Ang University 2018
Academic Excellence Scholarship, Chung-Ang University 2015-2017

**PROFESSIONAL
ACTIVITY**

- **Reviewer**

- IEEE Trans. on Pattern Analysis and Machine Intelligence (TPAMI)
- IEEE Trans. on Neural Networks and Learning Systems (TNNLS)
- Pattern Recognition (PR)

PATENT

1. Hyeran Byun, Jewook Lee, **Pilhyeon Lee**, and Kibeom Hong. “Method and Device for Extracting Video Feature”
- Korea patent, No. 10-2020-0153515 (Nov. 2020)
2. Hyeran Byun, **Pilhyeon Lee**, and Jewook Lee. “Apparatus and Method for Detecting Action Frame Based on Weakly-supervised Learning through Background Modeling via Uncertainty Estimation”
- Korea patent, No. 10-2020-0122806 (Sep. 2020)
3. Hyeran Byun and **Pilhyeon Lee**. “Method and Apparatus for Detecting Action Frame Based on Weakly-supervised Learning through Background Frame Suppression”
- PCT patent, No. PCT/KR2020/012645 (Sep. 2020)
- Korea patent, No. 10-2019-0151551 (Dec. 2019)
4. Hyeran Byun, Kibeom Hong, Sunhee Hwang, Gui-Young Son, Jewook Lee, **Pilhyeon Lee**, Sungho Park, and Minsong Ki. “Framework for Generating an Image Reconstructing Brain Activity of a Subject”
- Korea patent, No. 10-2018-0107014 (Sep. 2018)

TALK

- **Weakly-supervised Action Localization by Uncertainty Modeling**
- AAAI Oral talk, 2021.
- **Background Suppression Network for Weakly-supervised Temporal Action Localization**
- Korean Conference on Computer Vision (KCCV), 2020.
- AAAI Spotlight talk, 2020.

SKILL

Programming Languages

C/C++, Python, OpenCV, Tensorflow, Pytorch