

# Pilhyeon Lee

PH.D. STUDENT · YONSEI UNIVERSITY

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## Summary

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**Research Interest** How to effectively train models given incomplete data/labels in the real world

**Current Focus** Video Understanding, Weakly-supervised Learning

## Education

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### Yonsei University

PH.D IN COMPUTER SCIENCE

- Supervised by Prof. Hyeran Byun

Seoul, South Korea

Mar. 2018 - Present

### Chung-Ang University

B.S. IN COMPUTER SCIENCE AND ENGINEERING

- Honors: Magna cum laude (GPA: 4.18/4.5)

Seoul, South Korea

Mar. 2014 - Feb. 2018

## Experience

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### Microsoft Research Asia

RESEARCH INTERN

Beijing, China

- Working with Dr. Jinglu Wang and Dr. Yan Lu in the Media Computing Group

Dec. 2019 - Jun. 2020

## Publication

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### PREPRINT / IN SUBMISSION

#### Subject Adaptive EEG-based Visual Recognition

Pilhyeon Lee, Sunhee Hwang, Seogkyu Jeon, Hyeran Byun

2021

- Under review

### INTERNATIONAL CONFERENCE

#### Learning Action Completeness from Points for Weakly-supervised Temporal Action Localization

Pilhyeon Lee, Hyeran Byun

Oct. 2021

- IEEE/CVF International Conference on Computer Vision (ICCV)
- Oral presentation (3.3 % acceptance rate)

#### Feature Stylization and Domain-aware Contrastive Learning for Domain Generalization

Seogkyu Jeon, Kiboom Hong, Pilhyeon Lee, Jework Lee, Hyeran Byun

Oct. 2021

- The 29<sup>th</sup> ACM International Conference on Multimedia (MM)
- Oral presentation (9.2 % acceptance rate)

#### Continuous Face Aging Generative Adversarial Networks

Seogkyu Jeon, Pilhyeon Lee, Kiboom Hong, Hyeran Byun

Jun. 2021

- IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)

#### Learning Subject-independent Representation for EEG-based Drowsy Driving Detection

Sunhee Hwang, Pilhyeon Lee, Sungho Park, Hyeran Byun

Feb. 2021

- The 9<sup>th</sup> International Winter Conference on Brain-Computer Interface (BCI)
- Spotlight presentation

#### Weakly-supervised Temporal Action Localization by Uncertainty Modeling

Pilhyeon Lee, Jinglu Wang, Yan Lu, Hyeran Byun

Feb. 2021

- The 35<sup>th</sup> AAAI Conference on Artificial Intelligence (AAAI)
- Talk presentation (21.0 % acceptance rate)

#### Exploiting Transferable Knowledge for Fairness-aware Image Classification

Sunhee Hwang\*, Sungho Park\*, Pilhyeon Lee\*, Seogkyu Jeon, Dohyung Kim, Hyeran Byun

Nov. 2020

- The 15<sup>th</sup> Asian Conference on Computer Vision (ACCV)
- \* Equal contributions

## Background Suppression Network for Weakly-supervised Temporal Action Localization

Pilhyeon Lee, Youngjung Uh, Hyeran Byun

Feb. 2020

- The 34<sup>th</sup> AAAI Conference on Artificial Intelligence ([AAAI](#))
- **Spotlight presentation (20.6 % acceptance rate)**

## DOMESTIC JOURNAL / CONFERENCE

Conference: 4 papers (in Korean)

## Project

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### Development of BCI based Brain and Cognitive Computing Technology for Recognizing User's Intentions using Deep Learning

FUNDED BY INSTITUTE FOR INFORMATION & COMMUNICATIONS TECHNOLOGY PLANNING & EVALUATION (IITP)

[Yonsei Univ.](#)

- Developed a system detecting drowsy driving using EEG signals.
- Part of this work was summarized in a paper and accepted to BCI 2021.

Apr. 2017 - Dec. 2023

### Study on Audio, Video, 3d Map and Activation Map Generation System using Deep Generative Model

FUNDED BY INSTITUTE FOR INFORMATION & COMMUNICATIONS TECHNOLOGY PLANNING & EVALUATION (IITP)

[Yonsei Univ.](#)

- Developed a method to generate more precise temporal class activation map from untrimmed videos.
- This project supported the abroad internship at Microsoft Research Asia.

Jul. 2019 - Dec. 2020

### Fundamental Study of Vision Algorithms for Comprehensive and Thorough Understanding of Videos

FUNDED BY MINISTRY OF SCIENCE, ICT AND FUTURE PLANNING

[Yonsei Univ.](#)

- Developed a new framework for weakly-supervised temporal action localization.
- Part of this work was summarized in a paper and accepted to AAAI 2020.

Aug. 2017 - Dec. 2020

### Development of Long-range and Multi-person Tracking Method

FUNDED BY SAMSUNG ELECTRONICS Co., LTD.

[Yonsei Univ.](#)

- Developed a framework for action recognition based on pose and RGB streams.

May. 2020 - Nov. 2020

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

FUNDED BY INSTITUTE FOR INFORMATION & COMMUNICATIONS TECHNOLOGY PLANNING & EVALUATION (IITP)

[Microsoft Research Asia](#)

- Proposed a new background modeling approach to overcome the difficulty in rejecting background frames for weakly-supervised temporal action localization.
- This work was summarized in a paper and accepted to AAAI 2021.

Dec. 2019 - Jun. 2020

### Deep Learning based Object Detection for Image Analysis

FUNDED BY SAMSUNG ELECTRONICS Co., LTD.

[Yonsei Univ.](#)

- Built an object detection benchmark containing unusual factory scenes and reproduced the state-of-the-art object detection methods.

May. 2018 - Dec. 2018

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

FUNDED BY MINISTRY OF SCIENCE, ICT AND FUTURE PLANNING

[Chung-Ang Univ.](#)

- Assisted research on improving classification performance on multi-label data via instance selection algorithm.

Jun. 2017 - Feb. 2018

## Honors & Awards

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2021	<b>Excellent Paper Award</b> , The Conference of Korean Artificial Intelligence Association	<a href="#">South Korea</a>
2020	<b>Best Paper Award</b> , The Joint Conference of Microsoft and Korean Artificial Intelligence Association	<a href="#">South Korea</a>
2018	<b>Graduation Honors Award</b> , Chung-Ang University	<a href="#">South Korea</a>
2015 - 2018	<b>Academic Excellence Scholarship</b> , Chung-Ang University	<a href="#">South Korea</a>

## Presentation

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### Weakly-supervised Action Localization by Uncertainty Modeling

- AAAI talk, 2021.

### Background Suppression Network for Weakly-supervised Temporal Action Localization

- Korean Conference on Computer Vision (KCCV), 2020.
- AAAI Spotlight talk, 2020.

# Professional Activity

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## Reviewers

- IEEE Trans. on Pattern Analysis and Machine Intelligence (**TPAMI**)
- IEEE Trans. on Multimedia (**TMM**)
- IEEE Trans. on Image Processing (**TIP**)
- IEEE Trans. on Neural Networks and Learning Systems (**TNNLS**)
- Pattern Recognition (**PR**)

## Patent

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### Learning Method for Fair Image Classification and Device for Classifying Image Fairly

Hyeran Byun, Sunhee Hwang, Sungho Park, **Pilhyeon Lee**, Seogkyu Jeon, Dohyung Kim

Feb. 2021

- Korea patent (applied), No. 10-2021-0020521

### Apparatus and Method for Detecting Subject-independent Fatigue State Based on Brain Signal of Driver

Hyeran Byun, Sunhee Hwang, Sungho Park, **Pilhyeon Lee**, Jwook Lee, Dohyung Kim

Jan. 2021

- Korea patent (applied), No. 10-2021-0002145

### Method and Device for Extracting Video Feature

Hyeran Byun, Jwook Lee, **Pilhyeon Lee**, Kibeam Hong

Nov. 2020

- Korea patent (applied), No. 10-2020-0153515

### Apparatus and Method for Detecting Action Frame Based on Weakly-supervised Learning through Background Modeling via Uncertainty Estimation

Hyeran Byun, **Pilhyeon Lee**, Jwook Lee

Sep. 2020

- Korea patent (applied), No. 10-2020-0122806

### Method and Apparatus for Detecting Action Frame Based on Weakly-supervised Learning through Background Frame Suppression

Hyeran Byun, **Pilhyeon Lee**

Nov. 2019

- PCT patent (applied), No. PCT/KR2020/012645
- Korea patent (registered), No. 10-2201353

### Framework for Generating an Image Reconstructing Brain Activity of a Subject

Hyeran Byun, Kibeam Hong, Sunhee Hwang, Gui-Young Son, Jwook Lee, **Pilhyeon Lee**, Sungho Park, Minsong Ki

Sep. 2018

- Korea patent (registered), No. 10-2089014

## Skill

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**Programming** Python, OpenCV, C/C++, Java, LaTeX

**Deep Learning** Pytorch, Tensorflow

**Language** Korean, English