

# Jung-Hyun Byun

변정현, Contact: junghyun.byun@yonsei.ac.kr

## currently at

Ph.D. Candidate,  
Yonsei University,  
Seoul, Korea

## languages

Korean (native)  
English (fluent)

## programming

C++ (skilled)  
Python/CUDA/  
Matlab/Java (user)

## skills

OpenCV, OpenGL,  
openFrameworks

## last updated

June 10, 2020

## view online



## Interests

computer vision, computer graphics, machine learning and human-computer interaction  
augmented reality, projection mapping, point cloud processing and scene reconstruction

## Education

- |                         |   |                                 |
|-------------------------|---|---------------------------------|
| 2015.9.1<br>–2020.08.31 | <b>Ph.D.</b> candidate in Computer Science<br>Thesis: Projection Mapping and Augmented Reality for Pervasive AR Framework and Environment | Yonsei University, Seoul, Korea |
| 2011.3.1<br>–2015.2.28  | <b>B.Sc.</b> in Computer Science and Engineering  | Yonsei University, Seoul, Korea |

## Selected Publications

### Journal articles

- PPAP: Perspective Projection Augment Platform with Pan–Tilt Actuation for Improved Spatial Perception  
**Byun, Jung-Hyun**, Han, T.-D.  
*Sensors*, p. 2652. Multidisciplinary Digital Publishing Institute, 2019
- AR Pointer: Advanced Ray-Casting Interface Using Laser Pointer Metaphor for Object Manipulation in 3D Augmented Reality Environment  
Ro, H., **Byun, Jung-Hyun**, Park, Y. J., Lee, N. K., Han, T.-D.  
*Applied Sciences*, p. 3078. Multidisciplinary Digital Publishing Institute, 2019

### Conference proceedings

- FRISP: Framework for Registering Interactive Spatial Projection  
**Byun, Jung-Hyun**, Ro, H., Han, T.-D.  
*Proceedings of the 25th International Conference on Intelligent User Interfaces Companion*, 2020
- Accurate Control of a Pan-tilt System Based on Parameterization of Rotational Motion  
**Byun, Jung-Hyun**, Chae, S., Han, T.  
*Eurographics 2018 (Oral Presentation), Proceedings of the 39th Annual European Association for Computer Graphics Conference*, 2018
- AIR: Anywhere Immersive Reality with User-Perspective Projection  
**Byun, Jung-Hyun**, Chae, S., Yang, Y., Han, T.  
*Eurographics 2017 (Oral Presentation), Proceedings of the 38th Annual European Association for Computer Graphics Conference*, 2017

## Awards

- |      |  |
|------|--|
| 2019 | <b>Merit Academic Paper Award</b> (우수논문 장려상)<br>Yonsei University (연세대학교)                |
| 2019 | <b>Best Paper Presentation Award</b> (우수 논문 발표상)<br>Korea Multimedia Society (한국멀티미디어학회) |

- 2018 **Ph.D. Fellowship Award**  
NAVER Corporation (네이버 주식회사)
- 2018 **Best Demo Award**  
ACM International Conference on Multimedia (ACM MM)

## Invited Talks

- 2019 **NAVER Tech Talk** NAVER Corporation (네이버 주식회사)  
Projection Mapping and Augmented Reality for Pervasive AR Environment

## Patent

### Domestic (Republic of Korea)

이동형 프로젝션 기술을 이용한 증강현실 시스템 및 그 운영 방법  
AR System using Mobile Projection Technique and Operating Method Thereof  
Han, T., Kim, D. C., Seo, J., Chae, S., Yang, Y., **Byun, Jung-Hyun**  
*Korea Patent Registration No. 10-1819589-0000, 2018*

## Projects

- 2018.09.01 –2020.08.31 퍼스널 어시스턴트 구현을 위한 맥락인지 **Pervasive AR** 플랫폼 구축  
**Integration of Context-aware Pervasive AR Platform for Personal Assistant Implementation** National Research Foundation of Korea (한국연구재단)  
Role: Project Manager & Lead Researcher
- Research on applicability of deep learning-based spatial context-awareness in an augmented reality environment.
  - Research on integration of scene understanding technologies with projection-based augmented reality.
  - Research on real-time dynamic projection mapping on a pan-tilt platform.
- 2018.04.30 –2018.10.31 센서 융합 기반 손 동작 인식 기술 개발  
**Development of hand motion recognition technology based on sensor fusion** Samsung Electronics Company (삼성전자)  
Role: Project Manager
- Managed implementation of algorithms for identifying hand postures of workers using IMU sensor data.
- 2015.11.01 –2018.10.31 이동형 프로젝션 기술을 이용한 **Pervasive AR** 인터랙션 플랫폼 구축  
**Pervasive AR interaction platform construction using a mobile projection technology** National Research Foundation of Korea (한국연구재단)  
Role: Project Manager & Lead Researcher
- Designed a user-perspective rendering algorithm for correcting distortions of projection mapping caused by surface geometry.
  - Designed a visual servoing algorithm for accurately controlling pan-tilt servo motors based on rotation axis calibration.

- 2015.08.01 –2017.03.31 대규모 공연 및 방송을 위한 다중 자율 비행체 협업 기반 첨단 촬영 및 렌더링 기술 개발  
**Development of filming and rendering technology based on multi-autonomous flight collaboration for large-scale performance and broadcasting** Korea Institute of Science and Technology (KIST, 한국과학기술연구원)  
 Role: Researcher & Developer
- Designed and implemented scale-adaptive visual object tracking algorithm based on SVM.
  - Developed a Windows program for tracking multiple objects based on epipolar geometry.
- 2015.04.01 –2017.12.31 라이프 로깅을 위한 영상 기반 모바일 객체 인식 연구 개발  
**Research of vision-based mobile object recognition technology for life logging** Korea Institute of Science and Technology (KIST, 한국과학기술연구원)  
 Role: Researcher & Developer
- Implemented keypoint extraction and descriptor matching algorithms on an Android platform.
  - Developed Android applications for marker-less augmented reality and medicine recognition.

## Other Publications

### Journal articles

- PRISM: Interactive Projection Display System for Pervasive Registration of Interface with Spatial Manipulation  
**Byun, Jung-Hyun**, Ro, H., Kim, K., Han, T.-D.  
*Under Review. 2020*
- Axis Bound Registration of Pan-Tilt RGB-D Scans for Fast and Accurate Reconstruction  
**Byun, Jung-Hyun**, Han, T.-D.  
*Under Review. 2019*

### Conference proceedings

- Adaptive projection augmented reality with object recognition based on deep learning  
 Park, Y. J., Ro, H., **Byun, Jung-Hyun**, Han, T.-D.  
*Proceedings of the 24th International Conference on Intelligent User Interfaces: Companion, 2019*
- Projection-Based Augmented Reality Robot Prototype with Human-Awareness  
 Ro, H., **Byun, Jung-Hyun**, Kim, I., Park, Y. J., Kim, K., Han, T.-D.  
*2019 14th ACM/IEEE International Conference on Human-Robot Interaction (HRI), 2019*
- Display methods of projection augmented reality based on deep learning pose estimation  
 Ro, H., Park, Y. J., **Byun, Jung-Hyun**, Han, T.-D.  
*ACM SIGGRAPH 2019 Posters, 2019*
- Mobile device interaction using projector metaphor  
 Ro, H., Park, Y. J., **Byun, Jung-Hyun**, Han, T.-D.  
*Proceedings of the 24th International Conference on Intelligent User Interfaces: Companion, 2019*
- Meet AR-bot: Meeting Anywhere, Anytime with Movable Spatial AR Robot  
 Park, Y. J., Yang, Y., Ro, H., **Byun, Jung-Hyun**, Chae, S., Han, T. D.  
*ACM International Conference on Multimedia (ACM MM), 2018*
- PAMI: Projection Augmented Meeting Interface for Video Conferencing  
 Ro, H., Kim, I., **Byun, Jung-Hyun**, Yang, Y., Park, Y. J., Chae, S., Han, T.

*ACM International Conference on Multimedia (ACM MM), 2018*

A dynamic depth-variable ray-casting interface for object manipulation in ar environments

Ro, H., Chae, S., Kim, I., **Byun, Jung-Hyun**, Yang, Y., Park, Y., Han, T.

*Systems, Man, and Cybernetics (SMC), IEEE International Conference on, 2017*

Scale-adaptive tracking with structured output

**Byun, Jung-Hyun**, Chae, S.-H., Choi, H., Han, T.-D.

*Proceedings of HCI Korea, 2016*

Personal Smart Space: IoT based User recognition and Device control

Chae, S., Yang, Y., **Byun, Jung-Hyun**, Han, T.-D.

*Semantic Computing (ICSC), IEEE Tenth International Conference on, 2016*

Smart advisor: Real-time information provider with mobile augmented reality

Chae, S., Yang, Y., Choi, H., Kim, I., **Byun, Jung-Hyun**, Jo, J., Han, T.

*Consumer Electronics (ICCE), IEEE International Conference on, 2016*