

# Jung-Hyun Byun

Last updated: December 6, 2019

## contact

junghyun.byun  
@yonsei.ac.kr

## languages

Korean (native)  
English (fluent)

## programming

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

## skills

OpenCV, OpenGL,  
openFrameworks

## 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 –2020.08.31	<b>Ph.D.</b> candidate in Computer Science	Yonsei University, Korea
2011.3.1 –2015.2.28	<b>B.Sc.</b> in Computer Science and Engineering	Yonsei University, 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* 19.12 (2019) 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* 9.15 (2019) p. 3078. Multidisciplinary Digital Publishing Institute, 2019

### Conference proceedings

Accurate Control of a Pan-tilt System Based on Parameterization of Rotational Motion

**Byun, Jung-Hyun**, Chae, S., Han, T.

*EuroGraphics 2018 (Oral Presentation)*, The Eurographics Association, 2018

AIR: Anywhere Immersive Reality with User-Perspective Projection

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

*EuroGraphics 2017 (Oral Presentation)*, The Eurographics Association, 2017

## Awards

2018	<b>Best Demo Award</b> ACM International Conference on Multimedia (ACM MM)
2018	<b>Ph.D. Fellowship Award</b> NAVER Corporation

- |      |  |
|------|--|
| 2019 | <b>Best Paper Presentation Award</b><br>Korea Multimedia Society |
| 2019 | <b>Merit Academic Paper Award</b><br>Yonsei University           |

## Invited Talks

- |      |  |
|------|--|
| 2019 | <b>Title: Projection Mapping and Augmented Reality for Pervasive AR Environment</b><br>NAVER Corporation <div style="float: right; text-align: right;">NAVER Tech Talk</div> |
|------|--|

## Patent

### Domestic (Korea)

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<br>–2020.08.31 | <b>Integration of Context-aware Pervasive AR Platform for Personal Assistant Implementation</b><br>National Research Foundation of Korea (NRF)<br>Role: Project Manager & Lead Researcher <ul style="list-style-type: none"> <li>• Research on applicability of deep learning-based spatial context-awareness in an augmented reality environment.</li> <li>• Research on integration of scene understanding technologies with projection-based augmented reality.</li> <li>• Research on real-time dynamic projection mapping on a pan-tilt platform.</li> </ul> |
| 2018.04.30<br>–2018.10.31 | <b>Development of hand motion recognition technology based on sensor fusion</b><br>Samsung Electronics Company (SEC)<br>Role: Project Manager <ul style="list-style-type: none"> <li>• Managed implementation of algorithms for identifying hand postures of workers using IMU sensor data.</li> </ul>  |
| 2015.11.01<br>–2018.10.31 | <b>Pervasive AR interaction platform construction using a mobile projection technology</b><br>National Research Foundation of Korea (NRF)<br>Role: Project Manager & Lead Researcher <ul style="list-style-type: none"> <li>• Designed a user-perspective rendering algorithm for correcting distortions of projection mapping caused by surface geometry.</li> <li>• Designed a visual servoing algorithm for accurately controlling pan-tilt servo motors based on rotation axis calibration.</li> </ul>  |

- 2015.08.01 –2017.03.31 **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)  
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 **Research of vision-based mobile object recognition technology for life logging** Korea Institute of Science and Technology (KIST)  
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

Fast and Accurate Reconstruction of Pan-Tilt RGB-D Scans via Axis Bound Registration

**Byun, Jung-Hyun**, Han, T.-D.

*Under Review (2019). 2019*

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 (2019). 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*