

# Youngkyoon Jang

SENIOR RESEARCH SCIENTIST IN 3D VISION

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**Type of Permit** Settlement (2021.09-present), UKVI: Global Talent (2021.05-09), Tier2 (2016.06-2021.04)  
**Citizenship** S. Korea  
**Language** Korean (native) and English (fluent)

## Research Interests

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I develop novel human sensing technologies that aim to make interactions between humans and autonomous systems more intuitive in a real (3D) environment. These efforts often lie in **designing-collecting novel datasets, understanding human behaviours, learning-analysing visual attributes and investigating decision making fairness** based on visual computing and data analysis. Besides my research background in computer science, my work often incorporates aspects of **machine learning** (e.g., Random Forest), **Deep Learning** (e.g., 3DGS, NeRF, CNN) and computer vision.

Topics include **novel view synthesis, vision prediction stabilisation, action recognition, face/emotion detection, hand gesture recognition, AR/VR object selection & manipulation**, object recognition in a video, and person re-identification (via iris, finger vein, and face images) in a **real-time system**.

## Education

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**KAIST** 02/2012 - 08/2015  
*Ph.D. in Graduate School of Culture Technology (GSCT)* Daejeon, S. Korea

- Thesis: Context-driven Spatio-temporal Classifier for Articulated Hand Gesture Recognition
- Advisor: Prof. Woontack Woo
- Co-examiners: Prof. In So Kweon, Prof. Jeounghoon Kim, Dr. Se-Bum Paik, and Dr. Sung-Hee Lee

**Gwangju Institute of Science and Technology (GIST)** 09/2008 - 02/2012  
*Coursework Completion in Information and Communication Engineering* Gwangju, S. Korea

- I finished the coursework of Master and Ph.D. programs and transferred to KAIST
- Advisor: Prof. Woontack Woo

**Sangmyung University (SMU)** 03/2007 - 06/2008  
*Coursework Completion in Computer Science* Seoul, S. Korea

- I finished the coursework of Master program
- Advisor: Prof. Kang Ryoung Park

**Sangmyung University (SMU)** 03/2003 - 02/2007  
*B.S. in Computer Science* Seoul, S. Korea

- Graduated with honors (3rd ranked graduate)

## Professional Experience

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**Huawei Technologies Research & Development (UK) Limited (Noah's Ark Lab)** 11/2022 - present  
*Senior Research Scientist, 3D Vision team* London, UK

- **Developing a 3D Gaussian Splatting model**, optimised for environments with extremely limited data and computational resources. As a primary developer, I lead the **demonstration of potential use cases by integrating** our internal investigation results (such as 3DGS, LLM, and TTS) into a real-time system that generates adaptive interactive responses based on user input. 11/2023 - present
- **Developed a Neural Rendering model** and led organising research Workshop / Challenge in a View Synthesis for Human Heads, called 'To NeRF or not to NeRF' at ICCV 2023. 11/2022 - 10/2023

- Imperial College London** 07/2023 - 12/2023  
*Academic Visitor, Computing Dept., Host: Prof. Stefanos Zafeiriou* London, UK
- **Helping and reinforcing** the ICL's team in the context of the 3D capturing process using a light-stage, as described in the Funding Agreement (COVIP\_NN1231) between HUAWEI and ICL, and co-organising the 'To NeRF or not to NeRF: A View Synthesis Challenge for Human Heads' workshop at ICCV 2023.
- Disguise** 06/2022 - 10/2022  
*Software Engineer (Research Specialist), R&D Team* London, UK
- **Contributing a research project, called AdMiRe**, to develop, validate and demonstrate innovation solutions, based on Mixed Reality (MR) technology, which will allow for TV audiences a step change in interactivity, and bring for content creators a radical improvement in talent immersion and interaction with computer generated elements.
- Imperial College London** 05/2021 - 06/2022  
*Research Associate, PR-Lab., EEE Dept., Advisors: Prof. Yiannis Demiris* London, UK
- **Contributing a research project** related to Trustworthy Human-Robot Interaction. Investigating methods for robot's trustworthy decision making by understanding human behaviours.
- University of Bristol** 05/2018 - 04/2021  
*Senior Research Associate, VI-Lab., CS Dept., Advisors: Prof. Walterio Mayol-Cuevas, Dima Damen* Bristol, UK
- **Contributing a research project** related to human behaviour analysis in egocentric / wearable computer vision. Investigating decision making fairness by building a robust model for subjective behaviours.
- Queen Mary University of London** 06/2016 - 05/2018  
*Postdoc Researcher, MMV group, School of EECS, Advisor: Prof. Ioannis Patras* London, UK
- **Contributing a research project** related to automatic computer vision based analysis of human behaviour (affect) in retail environments.
- University of Cambridge** 07/2016 - 05/2018  
*Visiting Researcher, Computer Laboratory, Advisor: Prof. Hatice Gunes* Cambridge, UK
- I have been visiting Cambridge regularly (e.g. once a month) for conducting collaborative project related to human behaviour analysis in affective computing domain.
- KAIST** 08/2015 - 04/2016  
*Postdoc Researcher, Augmented Human Research Center, CTRI, Advisor: Prof. W. Woo* Daejeon, S. Korea
- **Managing a research project** related to facial landmark detection/tracking robust to head rotation and partial occlusions and high-quality augmentation.
  - Finalising research paper for hand-gesture-based novel Natural User Interface (NUI).
- KAIST** 02/2012 - 08/2015  
*Research Assistant, UVR Lab., Advisor: Prof. W. Woo* Daejeon, S. Korea
- Investigated hand gesture input mechanisms for wearable AR/VR computing.
  - **Wrote a research grant proposal** for "Highly Realistic and Human-centric VR Technology Development (for face, body and hair)" (especially, face part).
- Imperial College London (ICL)** 2011, 2014, 2015  
*Visiting Researcher, Imperial Computer Vision & Learning Lab., Advisor: Prof. T-K. Kim* London, UK
- Studied 3D static and dynamic hand gesture estimation as a novel NUI. 10/2014 - 01/2015
  - Studied 3D finger clicking action and position estimation in a wearable AR/VR. 01 - 02/2014
  - Studied multiple 3D objects recognition in a video. 09 - 11/2011
- GIST** 06/2008 - 01/2012  
*Research Assistant/Intern, U-VR Lab., Advisor: Prof. W. Woo* Gwangju, S. Korea
- RA, Investigated 3D object recognition in a video and user interfaces on a mobile device. 09/2008 - 01/2012
  - RI, Investigated smile training system on a mobile device. 06 - 08/2008
- Sangmyung University (SMU)** 03/2007 - 06/2008  
*Research Assistant, Computer Graphics & Computer Vision Lab., Advisor: Prof. K. R. Park* Seoul, S. Korea
- Investigated eyelid localisation for improving iris recognition accuracies and touchless finger vein recognition.

## Publication

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### International Journal (SCI/SCIE)

- IJ.06 Yavor Dragostinov, Daney Harardttr, Peter Edward McKenna, David A Robb, Birthe Nettet, Muneeb Imtiaz Ahmad, Marta Romeo, Mei Yii Lim, Chuang Yu, **Youngkyoon Jang**, Mohammed Diab, Angelo Cangelosi, Yiannis Demiris, Helen Hastie, Gnanathusharan Rajendran, *Preliminary psychometric scale development using the mixed methods Delphi technique*, Elsevier Methods in Psychology, vol. 7, article. 100103, Dec. 2022.
- IJ.05 **Youngkyoon Jang**, Hatice Gunes, Ioannis Patras, *Registration-Free Face-SSD: Single Shot Analysis of Smiles, Facial Attributes, and Affect in The Wild*, Computer Vision and Image Understanding (CVIU), vol. 182, pp. 17-29, May 2019.
- IJ.04 **Youngkyoon Jang**, Ikbeom Jeon, Tae-Kyun Kim, Woontack Woo, *Metaphoric Hand Gestures for Orientation-aware VR Object Manipulation with an Egocentric Viewpoint*, IEEE Transactions on Human-Machine Systems (THMS), vol. 47, no. 01, pp. 113-127, Feb. 2017.
- IJ.03 **Youngkyoon Jang**, Seung-Tak Noh, Hyung Jin Chang, Tae-Kyun Kim, and Woontack Woo, *3D Finger CAPE: Clicking Action and Position Estimation under Self-Occlusions in Egocentric Viewpoint*, IEEE Transactions on Visualization and Computer Graphics (TVCG), vol. 21, no. 4, April 2015.
- IJ.02 **Youngkyoon Jang**, Byung Jun Kang, and Kang Ryoung Park, *A Novel Portable Iris Recognition System and Usability Evaluation*, International Journal of Control, Automation, and Systems, vol.8, no.1, pp.91-98, February 2010.
- IJ.01 **Youngkyoon Jang**, Byung Jun Kang, and Kang Ryoung Park, *A Study on Eyelid Localization Considering Image Focus for Iris Recognition*, Pattern Recognition Letters (PRL), Vol. 29, Issue 11, pp. 1698-1704, 1 August 2008.

### International Conference

- IC.20 **Youngkyoon Jang**, Eduardo Pérez-Pellitero, *CoMapGS: Covisibility Map-based Gaussian Splatting for Sparse Novel View Synthesis*, IEEE/CVF CVPR, Nashville TN, USA, Jun 11-15, 2025.
- IC.19 **Youngkyoon Jang\***, Jiali Zheng\*, Jifei Song, Helisa Dharmo, Eduardo Pérez-Pellitero, Thomas Tanay, Matteo Maggioni, Richard Shaw, Sibi Catley-Chandar, Yiren Zhou, Jiankang Deng, Ruijie Zhu, Jiahao Chang, Ziyang Song, Jiahuan Yu, Tianzhu Zhang, Khanh-Binh Nguyen, Joon-Sung Yang, Andreea Dogaru, Bernhard Egger, Heng Yu, Aarush Gupta, Joel Julin, László A. Jeni, Hyeseong Kim, Jungbin Cho, Dosik Hwang, Deukhee Lee, Doyeon Kim, Dongseong Seo, SeungJin Jeon, YoungDon Choi, Jun Seok Kang, Ahmet Cagatay Seker, Sang Chul Ahn, Aleš Leonardis, Stefanos Zafeiriou, *VSCHH 2023: A Benchmark for the View Synthesis Challenge of Human Heads*, IEEE Workshop on To NeRF or not to NeRF: A View Synthesis Challenge for Human Heads (VSCHH) (In conjunction with ICCV 2023), pp. 1121-1128, Paris, France, Oct. 02, 2023. (\* indicates equal contribution)
- IC.18 **Youngkyoon Jang\***, Jiali Zheng\*, Athanasios Papaioannou, Christos Kampouris, Rolandos Alexandros Potamias, Foivos Paraperas Papantoniou, Efstathios Galanakis, Aleš Leonardis, Stefanos Zafeiriou, *ILSH: The Imperial Light-Stage Head Dataset for Human Head View Synthesis*, IEEE Workshop on To NeRF or not to NeRF: A View Synthesis Challenge for Human Heads (VSCHH) (In conjunction with ICCV 2023), pp. 1112-1120, Paris, France, Oct. 02, 2023. (\* indicates equal contribution. It was published with an incorrect author list.)
- IC.17 **Youngkyoon Jang**, Yiannis Demiris, *Message Passing Framework for Vision Prediction Stability in Human Robot Interaction*, ICRA 2022, Philadelphia (PA), USA, May 23-27, 2022.
- IC.16 **Youngkyoon Jang**, Brian Sullivan, Casimir Ludwig, Iain D. Gilchrist, Dima Damen, Walterio Mayol-Cuevas, *EPIC-Tent: An Egocentric Video Dataset for Camping Tent Assembly*, The 5th International Workshop on Egocentric Perception, Interaction and Computing (EPIC) (In conjunction with ICCV 2019), Seoul, South Korea, Oct., 2019.
- IC.15 **Youngkyoon Jang**, Hatice Gunes, Ioannis Patras, *SmileNet: Registration-free Smiling Face Detection In The Wild*, 7th IEEE Workshop on Analysis and Modeling of Faces and Gestures (In conjunction with ICCV 2017), pp. 1581-1589, Venice, Italy, Oct. 28, 2017.
- IC.14 **Youngkyoon Jang**, Eunah Jung, Sung Sil Kim, Jeongmin Yu, Woontack Woo, *User-Independent Face Landmark Detection and Tracking for Spatial AR Interaction*, Proceedings of the 18th International Conference on Human-Computer Interaction, pp. 210-220, Jul, 2016.
- IC.13 **Youngkyoon Jang**, Ikbeom Jeon, Tae-Kyun Kim, Woontack Woo, *Multi-Layered Random Forest-based Metaphoric Hand Gesture Interface in VR*, 2nd IEEE Workshop on Observing and Understanding Hands in Action (In conjunction with CVPR 2016), Extended Abstract (poster), Las Vegas, NV, USA, Jul, 2016. (Best Poster Award)

- IC.12 Jeongmin Yu, Seungtak Noh, **Youngkyoon Jang**, Gabyong Park, Woontack Woo, *A Hand-based Collaboration Framework in Egocentric Coexistence Reality*, The 12th International Conference on Ubiquitous Robots and Ambient Intelligence (URAI), pp. 545-548, KINTEX, Goyang, S. Korea, Oct. 28-30, 2015.
- IC.11 **Youngkyoon Jang**, Seung-Tak Noh, Hyung Jin Chang, Tae-Kyun Kim, and Woontack Woo, *3D Finger CAPE: Clicking Action and Position Estimation under Self-Occlusions in Egocentric Viewpoint*, **IEEE VR** 2015, Arles, Camargue, Provence, France, Mar. 23-27, 2015. (**long paper, accept rate=13.8% (13/94)**, also to appear in IEEE Trans. on Visualization and Computer Graphics)
- IC.10 Yang Liu\*, **Youngkyoon Jang\***, Woontack Woo, and Tae-Kyun Kim, *Video-based Object Recognition using Novel Set-of-Sets Representations*, 3rd IEEE Workshop on Egocentric (First-person) Vision (In conjunction with **CVPR** 2014), pp.519-526, Columbus, Ohio, USA, Jun. 2014. (\* indicates equal contribution)
- IC.09 Jooyeun Ham, Jonggi Hong, **Youngkyoon Jang**, Seung Hwan Ko, and Woontack Woo, *Smart Wristband: Touch-and-motion-tracking Wearable 3D Input Device for Smart Glasses*, HCII 2014, Heraklion, Crete, Greece, Jun. 22-27, 2014. (**Best Paper Award**)
- IC.08 Jooyeun Ham, Jonggi Hong, **Youngkyoon Jang**, Seung Hwan Ko, and Woontack Woo, *Smart Glasses: Wearable Input Device Based on Wristband-type Motion-aware Touch Panel*, IEEE 3DUI 2014 (poster), Minneapolis, USA, Mar. 29-30, 2014.
- IC.07 **Youngkyoon Jang**, and Woontack Woo, *Unified Visual Perception Model for Context-aware Augmented Reality*, **ISMAR** 2013, Doctoral Consortium program (officially, poster), Adelaide, S.A, Australia, Oct. 1-4, 2013.
- IC.06 **Youngkyoon Jang**, and Woontack Woo, *Local Feature Descriptors for 3D Object Recognition in Ubiquitous Virtual Reality*, International Symposium on Ubiquitous Virtual Reality 2012, pp. 42-45, Daejeon, S. Korea, Aug. 22-25, 2012.
- IC.05 **Youngkyoon Jang**, and Woontack Woo, *A Stroke-based Semi-automatic ROI Detection Algorithm for In-Situ Painting Recognition*, HCII2011 (Virtual and Mixed Reality, Part II), LNCS 6774, pp. 167-176, Orlando, Florida, USA, July 9-14, 2011 (LNCS).
- IC.04 Ahyoung Choi, Youngmin park, **Youngkyoon Jang**, Changgu Kang, and Woontack Woo, *mARGraphy: Mobile AR-based Dynamic Information Visualization*, 9th International Symposium on Ubiquitous Virtual Reality 2011, pp. 37-39, Jeju, S. Korea, July 1-4, 2011.
- IC.03 Hyoseok Yoon, Nohyoung Park, Wonwoo Lee, **Youngkyoon Jang**, and Woontack Woo, *QR Code Data Representation for Mobile Augmented Reality*, AR Standards Meeting 2011, pp. 000-000, 2011.
- IC.02 Choonsung Shin, Hyejin Kim, Changgu Kang, **Youngkyoon Jang**, Ahyoung Choi, and Woontack Woo, *Unified Context-aware Augmented Application Framework for Supporting User-Driven Mobile Tour Guide*, 8th International Symposium on Ubiquitous Virtual Reality 2010, pp. 52-55, Gwangju, S. Korea, July 7-10, 2010.
- IC.01 **Youngkyoon Jang**, and Woontack Woo, *Adaptive Lip Feature Point Detection Algorithm for Real-time Computer Vision-based Smile Training System*, The 4th International Conference on E-Learning and Games (Edutainment 2009), LNCS 5670, pp. 379-389, Banff, Canada, August 9-11, 2009 (LNCS).

#### Domestic Journal (in Korean)

- DJ.06 Seung-Tak Noh, Taejin Ha, **Youngkyoon Jang**, Gabyong Park, and Woontack Woo, *Present and Future of Contactless Hand Posture Estimation Techniques for Wearable AR-based Interaction*, Journal of The Korean Society of Broadcast Engineers (KSBE), vol. 19, no. 3, pp. 88-102, 2014.
- DJ.05 **Youngkyoon Jang**, Ju-Whan Kim, Seung geon Moon, Tek-Jin Nam, Dong soo Kwon, and Woontack Woo, *Complementary Feature-point-based Descriptors for 3D Object Recognition*, Journal of KIISE:Software and Applications, vol. 39, no. 11, pp. 848-853, Nov. 2012. (**Best Paper on KCC 2012**)
- DJ.04 **Youngkyoon Jang**, and Woontack Woo, *Hough Transform-based Semi-automatic Vertex Detection Algorithm on a Touch Screen Mobile Phone*, Journal of KIISE: Computing Practices and Letter, vol. 16, no. 5, pp. 596-600, May. 2010. (**Excellent Paper on the 36th Autumn Conference**)
- DJ.03 **Youngkyoon Jang**, Woontack Woo, Dongchul Kim and Choonsung Shin, *Mobile Augmented Reality Technology Trends*, Open Standards and Internet Association Standards & Technology Review (Special Issue for Mobile Internet), vol. 38, no. 1, pp. 41-52, Mar. 2010.
- DJ.02 **Youngkyoon Jang**, Byung Jun Kang, and Kang Ryoung Park, *A Study on Touchless Finger Vein Recognition Robust to the Alignment and Rotation of Finger*, Journal of Information Processing Society (B), vol. 15-B, no. 4, pp. 275-284, Aug. 2008.
- DJ.01 **Youngkyoon Jang**, Byung Jun Kang, and Kang Ryoung Park, *Eyelid Detection Algorithm Based on Parabolic Hough Transform for Iris Recognition*, Journal of IEEK, vol. 44, no. 01, pp. 94-104, Jan. 2007.

#### Domestic Conference (in Korean)

- DC.07 Sungsil Kim, Jeong-Hun Jo, **Youngkyoon Jang**, and Woontack Woo, *Mobile Face Recognition Lock Screen Designed for Quantified Self and Self-Reflection Feedback*, KIISE, Dec. 18-20, 2014, Phoenix Park.

- DC.06 **Youngkyoon Jang**, Seungtak Noh, and Woontack Woo, *RGB-D image-based touch points detection for hand-plane interaction*, HCI Korea, Feb. 12-14, 2014, High1 Resort.
- DC.05 **Youngkyoon Jang**, and Woontack Woo, *RGB-D image-based multiple objects localization and recognition*, HCI Korea, Jan. 30-Feb.01, 2013, High1 Resort.
- DC.04 **Youngkyoon Jang**, Ju-Whan Kim, Seung geon Moon, Tek-Jin Nam, Dong soo Kwon, and Woontack Woo, *Object Recognition utilizing Complementary Feature-point-based descriptor containing color information*, Korea Computer Congress (KCC), Jun. 27-29, 2012, Jeju Phoenix Island Hotel.
- DC.03 Nohyoung Park, **Youngkyoon Jang**, and Woontack Woo, *RGB-D image feature point extraction and description method for 3D object recognition*, Korea Computer Congress (KCC), Jun. 27-29, 2012, Jeju Phoenix Island Hotel.
- DC.02 **Youngkyoon Jang**, and Woontack Woo, *Hough Transform-Based Semi-Automatic Vertex Detection Algorithm for Object Modeling on a Touch Screen Mobile Phone*, The 36th Autumn Conference (KIISE), Nov. 27-28, 2009, Ehwa Womans University.
- DC.01 **Youngkyoon Jang**, Byung Jun Kang, and Kang Ryoung Park, *A Study on Mobile Iris Recognition System*, The 20th Workshop on Image Processing and Image Understanding (IPIU 2008), Feb. 20-22, 2008, Jeju Grand Hotel. (**Invited Tutorial**)

### ETC (poster, workshop, demo)

- Etc.05 Shijia Feng, Michael Wray, Brian Sullivan, **Youngkyoon Jang**, Casimir Ludwig, Iain Gilchrist, Walterio Mayol-Cuevas, *Are you Struggling? Dataset and Baselines for Struggle Determination in Assembly Videos*, arXiv Feb. 16, 2024.
- Etc.04 **Youngkyoon Jang**, Ikbeom Jeon, Tae-Kyun Kim, and Woontack Woo, *Symbolic Hand Gesture Interface in Wearable AR*, APMR 2016, Andong, S. Korea, Apr. 22-24, 2016. (**Best Presentation Award**)
- Etc.03 **Youngkyoon Jang**, Ikbeom Jeon, Hyung-Il Kim, Hui Shyong Yeo, Tae-Kyun Kim, and Woontack Woo, *Static-Dynamic Gesture based AR Interaction and Applications*, KJMR 2015, Daiichi Takimoto, Hokkaido, Japan, Apr. 24-26, 2015.
- Etc.02 **Youngkyoon Jang**, Hyung Jin Chang, Tae-Kyun Kim, and Woontack Woo, *Unified Visual Perception Model and Its Application*, KJMR 2014, Jeonju, S. Korea, Apr. 18-20, 2014.
- Etc.01 **Youngkyoon Jang**, Byung Jun Kang, and Kang Ryoung Park, *A Study on Eyelid Detection for Iris Recognition*, The 5th BERB Biometrics Workshop, Feb. 1-2, 2007, Yonsei University. (in Korean)

## Patents

### International including US Patent, PCT (Registered)

- IP.03 Methods and systems for processing image data, #: 11308348, date (19/Apr/2022), inventors (Jag Minhas, Magdi Ayad, Hatice Gunes, Ioannis Patras, **Youngkyoon Jang**), Assignees (Sensing Feeling Limited, Cambridge Enterprise Limited, Queen Mary University of London), United States Patent
- IP.02 Method and system for providing feedback ui service of face recognition-based application, #: 2018/0121715, date (03/May/2018), inventors (Woon Tack Woo, JO Jeonghun, Sung Sil Kim, **Young Kyoon Jang**), applicant (Korea Advanced Institute of Science and Technology), United States Patent
- IP.01 Apparatus and method for detecting a vertex of an image, #: 8867784, date (21/Oct/2014), inventors (Woontack Woo, **Youngkyoon Jang**), Assignees (Gwangju Institute of Science and Technology), United States Patent

### KOR (Registered)

- DR.09 Portable Facial Expression Training System and Methods thereof, #: 101510798, date (03/04/2015), inventor (**Youngkyoon Jang**, W. Woo, A. Choi), applicant (GIST)
- DR.08 RGB-D image-based multiple objects localization and recognition, #: 101486543, date (20/01/2015), inventor (**Youngkyoon Jang**, W. Woo), applicant (KAIST)
- DR.07 RGB-D Image based feature point description and matching method for 3D object detection, #: 101478709, date (26/12/2014), inventor (W. Woo, N. Park, **Youngkyoon Jang**), applicant (KAIST)
- DR.06 Local feature descriptors utilizing local shape of features for 3D object recognition, #: 101442042, date (12/09/2014), inventor (W. Woo, **Youngkyoon Jang**), applicant (KAIST)
- DR.05 Object Recognition utilizing Complementary Feature-point-based descriptor containing color information, #: 101374726, date (10/03/2014), inventor (**Youngkyoon Jang**, J.Kim, S. Moon, T. Nam, D. Kwon, W. Woo), applicant (KAIST)
- DR.04 Interesting area detecting apparatus, method, and recording medium thereof capable of improving recognition efficiency in a side detection attempt, #: 101272448, date (31/05/2013), inventor (**Youngkyoon Jang**, W. Woo), applicant (GIST)

- DR.03 Apparatus and method for detecting a vertex on the screen of a mobile terminal, #: 10-1032446, date (25/04/2011), inventor (**Youngkyoon Jang**, W. Woo), applicant (GIST)
- DR.02 Method for Personal Identification Using Finger-veins, #: 10-0954776, date (19/04/2010), inventor (B. Kang, **Youngkyoon Jang**, H. Lee, K. Park), applicant (Sangmyung Univ.)
- DR.01 The eyelid detection and eyelash interpolation method for the performance enhancement of iris recognition, #: 10-0794361-00-00, date (07/01/2008), inventor (B. Kang, **Youngkyoon Jang**, K. Park, J. Kim), applicant (Yonsei Univ.)

#### KOR (Pending)

- DP.06 Metaphoric Hand Gestures for Orientation-aware VR Object Manipulation, #: 10-2016-0037120, date (28/03/2016), inventor (**Youngkyoon Jang**, I. Jeon, T-K. Kim, W. Woo), applicant (KAIST)
- DP.05 Click detecting apparatus and method for detecting click in first person viewpoint, #: 10-2016-0004289, date (13/01/2016), inventor (**Youngkyoon Jang**, S-T. Noh, H. J. Chang, T-K. Kim, W. Woo), applicant (KAIST)
- DP.04 A recommendation system using laughter information accumulated by mobile expression-recognition device, #: 10-2015-0046990, date (02/04/2015), inventor (W. Woo, J. Jo, S. Kim, **Youngkyoon Jang**), applicant (KAIST)
- DP.03 QR code data representation for mobile augmented reality, #: 2010-0119208, date (26/11/2010), inventor (W. Woo, H. Yoon, N. Park, W. Lee, **Youngkyoon Jang**), applicant (GIST)
- DP.02 Capturing device for touchless finger-vein image, #: 10-2008-0005747, date (18/01/2008), inventor (K. Park, B. Kang, **Youngkyoon Jang**, E. Lee, D. Jeong), applicant (Sangmyung Univ.)
- DP.01 The feature extraction method for finger vein recognition, #: 10-2007-0132446, date (17/12/2007), inventor (B. Kang, **Youngkyoon Jang**, E. Lee, D. Jeong, H. Lee, K. Park), applicant (Sangmyung Univ.)

## Awards & Honors

<b>Huawei LRC 2023</b>	Best Technology Breakthrough Award Huawei Year End Ceremony, sponsored by Huawei London Research Center (LRC)	12/2023
<b>CVPRW 2016</b>	Best Poster Award (IC.13) IEEE CVPR16 Workshop on HANDS, sponsored by Facebook/Oculus and Purdue Univ.	07/2016
<b>APMR 2016</b>	Best Presentation Award (ETC.04) Asia-Pacific Workshop on Mixed Reality 2016	04/2016
<b>HCII 2014</b>	Best Paper Award (IC.09) International Conference on Distributed, Ambient and Pervasive Interactions	06/2014
<b>KCC 2012</b>	Best Paper Award (DC.04) Korea Computer Congress (KCC) 2012	06/2012
<b>KCC 2012</b>	Best Presentation Award (DC.03) Korea Computer Congress (KCC) 2012	06/2012
<b>KIISE 2009</b>	Best Paper Award (DC.02) The 36th Autumn Conference, Korean Institute of Inf. Sci. & Eng. (KIISE)	11/2009
<b>SK Telecom co.</b>	Creative Challenge Award 2013 (Smart Wristband, AirSculpt) Creative Challenge for Designing Novel Wearable User Interface	02/2014
<b>ISUVR 2012</b>	The 1st Prize Design Challenge Activity (Topic: Fun in AR Glasses)	08/2012
<b>Government-Sponsored Student (Master's and PhD studies), South Korea</b>		
	Full Scholarship (KAIST), sponsored by the Ministry of Culture, Sports and Tourism (MCST)	02/2012 - 08/2015
	Full Scholarship (GIST), sponsored by the Ministry of Science and ICT	09/2008 - 01/2012
<b>Department of Information and Communication (DIC), GIST</b>		
	DASAN Scholarship - 1st DIC Research Excellent Scholarship Student	09/2010
<b>Korea Science and Engineering Foundation (KOSEF), Korea Student Aid Foundation (KOSAF)</b>		
	Science and Engineering Graduate Research Scholarship Student	09/2007 - 08/2008
<b>Sangmyung University Scholarship</b>		
	Merit-based scholarship for 6 semesters	09/2003 - 08/2006

## Teaching Experience

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### Teaching Assistant or Guest Lecture

ELEC97046/97121: Human-Centered Robotics, Dept. of EEE, Imperial College London.	01 - 03/2022
MPhil ACS, Part III: Affective Computing (L44), Computer Lab., University of Cambridge.	02/11/2017
GCT555: 3D Interaction Design, Graduate School of Culture Technology, KAIST.	09 - 12/2013
GCT654: Visual Computing, Graduate School of Culture Technology, KAIST.	02 - 05/2012
Human-Computer Interaction, Digital Image Processing, etc., Undergraduate, SMU.	03/2007 - 06/2008

### Research Mentoring (PG: postgraduate, UG: undergraduate)

Ikbeom Jeon, KAIST PG, M.S. Student of UVR Lab. [Static Hand Gesture Recognition]	08/2015 - 04/2016
Jaihee Kim, KAIST UG, Research Intern of AHRC [Refinement of Random Forests]	12/2015 - 02/2016
Seunghyo Kang, KAIST UG, Research Intern of AHRC [Facial Landmark Detection]	12/2015 - 02/2016
Eunah Jung, KAIST UG, Research Intern of AHRC [Facial Landmark Detection]	08/2015 - 11/2015
Sungsil Kim, KAIST UG, Research Intern of AHRC [Head Pose Estimation]	07/2015 - 11/2015
Sungsil Kim, KAIST UG, Undergraduate Research Program (URP). [Face Recog. for QS]	12/2014 - 06/2015
Junsoo Park, KAIST UG, URP. [UI Design for Quantified-Self (QS)]	12/2014 - 06/2015
Sungsil Kim, KAIST UG, Research Intern of UVR Lab. [Smiley Face Recognition]	06/2014 - 12/2014

### Undergraduate Tutoring

Tutor of Tutoring Program (C/C++ Programming), Sangmyung Univ.	08 - 12/2005
Teaching Assistant of Jeju Embedded Camp (Embedded Programming), Sangmyung Univ.	01 - 02/2005

## Research Project Experience

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### Optimized 3D Gaussian Splatting for Resource-Constrained Environments

*Internal Research Project, Huawei Noah's Ark Lab London* 11/2023 - present

- As a project leader, I designed an exceptionally efficient algorithm that operates on extremely limited data and computational resources. In addition, I designed an interactive user interface that employed 3DGS techniques. This interface, coupled with a VR headset, immersively displays AI-generated responses.

### Neural Rendering in 3D Novel View Synthesis

*Internal Research Project, Huawei Noah's Ark Lab London* 11/2022 - 10/2023

- As a project leader, I led the design and collection of a high-resolution (4K) head image dataset called the Imperial Light-Stage Head (ILSH) dataset. This dataset can be used for both Neural Rendering and 3D vision research. Additionally, I organised an ICCV workshop and challenges (To NeRF or not to NeRF: VSCHH at ICCV 2023) that invited not only neural rendering methods but also conventional 3D vision methods. This allowed researchers to bridge these perspectives and advance 3D view synthesis research.

### Advanced Mixed Realities (AdMiRe)

*Horizon 2020, European Union (EU)* 06/2022 - 10/2022

- As a research member of the project, developing advanced solutions for immersive and interactive mixed reality.

### ENhanced Transparent inteRaction for trUstworthy and Safe auTonomy (EN-TRUST)

*UKRI, Engineering and Physical Sciences Research Council (EPSRC)* 05/2021 - 06/2022

- As a member of the project, developing advanced human behaviour understanding methods for Trustworthy Human-Robot Interaction.

### GLAncable Nuances for Contextual Events (GLANCE)

*EPSRC* 05/2018 - 04/2021

- As a member of the project, studying and developing advanced human behaviour analysis techniques including deep learning-based real-time object detection and behaviour recognition in egocentric videos.

### Sensing Feeling

*Innovate UK* 06/2016 - 05/2018

- As a member of the project, studying and developing advanced automated human emotion-sensing techniques including deep learning-based real-time face detection and affect recognition in videos.

- Highly Realistic and Human-centric VR Technology Development** 06/2015 - 04/2016  
*Funded by an International Company (requested for confidential treatment)*
- As a (face) team leader of the project, **helped to write a grant proposal and independently managing the team** for developing facial landmark detection/tracking algorithms, which are robust to head rotation and partial occlusions.
- Global Frontier R&D on <Human-centered Interaction for Coexistence>** 12/2011 - 04/2016  
*Ministry of Education and Science Technology (MEST), National Research Foundation (NRF) of Korea*
- As a member of the project, studying unified visual perception model, which imitates the human visual perception process, for the stable object recognition necessarily required for augmented reality in the field as well as spatio-temporal classifier for articulated hand gesture estimation in egocentric view.
- Facial Expression Recognition for Mining Emotion** 06/2014 - 05/2015  
*KAIST*
- As a mentor of the project, managed the team and give guidance how to improve the motivation of making a smiley face by taking intended inconvenient interactions.
- Development of Experience Tour Technology based on Mobile Mixed Reality** 03/2009 - 01/2012  
*Korea Creative Content Agency (KOCCA) of Ministry of Culture, Sports and Tourism (MCST)*
- As a member of the project, studied how to improve the recognition rate over time by selecting a representative code and regenerating the code. Moreover, developed semi-automatic region of interest (ROI) detection and recognition for user-participated mobile mixed reality.
- Mobile Social Media Retrieval using Hierarchical Context Representation** 12/2010 - 07/2011  
*Ministry of Knowledge and Economy (MKE)*
- As a member of the project, developed planar painting detection and recognition module for enrolled tag retrieval as a preliminary context, developed in-situ code registration module for enrolling a tag.
- Touchless Finger-vein Recognition System for User Authentication** 10/2007 - 06/2008  
*Seoul Development Institute (SDI)*
- As a member of the project, developed touchless finger-vein recognition system.
- Unobtrusive Iris Recognition Technology (Iris Recognition on Mobile Devices)** 08/2005 - 06/2008  
*Korea Science and Engineering Foundation (KOSEF)*
- As a member of the project, developed eyelid localization method for improving iris recognition accuracies and integrated other modules, such as iris region detection and pattern extraction/matching, for making a complete mobile iris recognition system.

## Invited Talks

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- Aligning Data Strategies in Computer Vision**  
 Department of AI, Korea University, S. Korea. 12/12/2024  
 Graduate School of AI, POSTECH, S. Korea. 02/12/2024
- Towards Natural Human Behaviour Sensing in Human-X Interaction, and My Career Path**  
 Global Mentoring Program, KIST-UST, S. Korea. 10/06/2022
- Towards Natural Human Behaviour Sensing in Trustworthy Human-Robot Interaction**  
 Graduate School of Culture Technology, KAIST, S. Korea. 15/02/2022
- Towards Natural Human Behaviour Sensing in Trustworthy HRI and Potential Robotics Projects**  
 Mokpo Hongil High School, S. Korea. 14/01/2022
- Towards Natural Human Behaviour Sensing in Human-X Interaction**  
 HCI Research Center, Dankook University, S. Korea. 22/07/2021



<b>Towards Natural Human Behaviour Sensing in Egocentric Viewpoint</b> Facebook Reality Labs, Redmond, US.	29/10/2020
<b>Towards Affect Recognition In The Wild: Registration-free Smile Detection Using CNN</b> Augmented Reality Research Centre (ARRC), KAIST, S. Korea.	03/08/2017
<b>Human Behaviour and Affect Recognition: Hand Gestures and Facial Expression</b> Intelligent Image Processing Research Centre, KETI, S. Korea.	01/08/2017
<b>Alumni Mentoring: Research Topics and Career Path in AR/VR</b> Graduate School of Culture Technology, KAIST, S. Korea.	04/05/2016
<b>Hand Gesture-based User Interface in Ubiquitous Virtual Reality</b> College of Information and Communication Engineering, Daegu University, S. Korea.	29/04/2016
<b>Symbolic Hand Gesture Interface in Wearable AR: Multi-Layered Forest-based Gestures Learning</b> Realistic Information Platform Research Center, KETI, S. Korea.	26/04/2016
<b>NDHS Mentoring: Research Topics and Career Path in Computer Science and Engineering</b> NamDoHakSuk (NDHS), Seoul, S. Korea.	02/04/2016
<b>Hand Gesture-based UI in Egocentric Viewpoint: Learning Spatio-Temporal Classifiers</b> Computer Graphics Department, Max-Planck Institute for Informatics (MPII), Germany.	01/02/2016
<b>Special Lecture Series: Research Topics and Career Path in Computer Science and Engineering</b> Mokpo Hongil High School, S. Korea.	18/12/2015
<b>Learning Spatio-temporal Classifier for Articulated Hand Gestures in UVR</b> VTouch Research Group, VTouch Inc, S. Korea.	17/12/2015
<b>Hand-based User Interaction Research Trends and User Experience Design in UVR</b> GSCT Course (GCT555: 3D Interaction Design), KAIST, S. Korea	12/11/2015
<b>User Interface Research Trends and Its Industrial Applications in UVR</b> Korea Electric Power Research Institute, Korea Electric Power Corporation (KEPCO), S. Korea.	15/10/2015
<b>UVR Research Trends and Hand-based Interaction in Wearable UVR</b> Realistic Information Platform Research Center, KETI, S. Korea.	03/08/2015

## Professional Service

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<b>Area Chair (AC), Reviewer (R) and Tech. Program Committee (TPC)</b>	
(R) International Journal of Computer Vision ( <b>IJCV</b> )	2023
(R) Entertainment Computing ( <b>EC</b> )	2022
(R) Pattern Recognition ( <b>PR</b> )	2019
(R) Image and Vision Computing ( <b>IVC</b> ) Journal	2016, 2018
(R) Sensors (ISSN 1424-8220)	2017
(R) IEEE Transactions on Visualization and Computer Graphics ( <b>TVCG</b> )	2016
(R) International Journal of Robotics and Automations ( <b>IJRA</b> )	2009
(R) IEEE Computer Vision and Pattern Recognition ( <b>CVPR</b> )	2020, 2025
(AC) IEEE Virtual Reality ( <b>VR</b> ); Conference Track	2019-2020
(TPC) British Machine Vision Conference ( <b>BMVC</b> )	2017-2019
(TPC) IEEE <b>ICCV/ECCV</b> Workshop on Egocentric Perception, Interaction and Computing (EPIC)	2018-2019
(TPC) IEEE <b>CVPR/ICCV</b> Workshop on Observing and Understanding <b>HANDS</b> in Action	2016, 2019
(TPC) IEEE Conference on Automatic Face and Gesture Recognition ( <b>FG</b> )	2017-2018
(R) Augmented Human International Conference ( <b>AH</b> )	2016

(R) IEEE International Symposium on Mixed and Augmented Reality (**ISMAR**) 2011, 2013, 2015

(R) Korean Institute of Next Generation Computing (KING Computing) 06, 12/2015

### Organizing Committees (OC)

(OC) IEEE **ICCV** Workshop on To NeRF or not to NeRF: VSCHH, Lead Organizer 2023

(OC) University of Bristol Visual Information Laboratory Seminar Session, Organizer 2018-2021

(OC) IEEE International Symposium on Ubiquitous Virtual Reality (ISUVR), General Chair 2015

(OC) IEEE ISUVR, Organizing Chair 2013

(OC) IEEE ISUVR, Student Volunteer Chair 2012

### Student Volunteer

IEEE ISMAR (2013), HCI International (2011), IEEE ISUVR (2008-2010)

## Exhibition and Selected Press

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### Exhibition

Center of Human-centered Interaction for Coexistence (CHIC) Tech. Fair 2015, 09-10/07/2015

"3D Finger CAPE" and "SD Gesture"

### Selected Press

Korean Broadcasting System (KBS1): Cosmopolitan, 18/04/2015

"Augmented Reality: intersection of virtual reality and reality", "3D Finger CAPE"

## Technical Skills

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### Programming Languages

**Python**, **C/C++**, Matlab, Objective C, Javascript, and HTML

### Operating Systems

**Linux/Unix**, **Windows**, iOS, and Mac OS X

### Libraries

**PyTorch (libtorch)**, **Theano (Lasagne)**, OpenCV, Point Cloud Library (PCL)

### Professional Tools

**Unity**, Adobe Photoshop, Adobe Illustrator, and Autodesk 3ds MAX

## References

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References available upon request