Changjae Oh

Curriculum Vitae

Career

Sep. 2019–Present
Lecturer (Assistant Professor), *School of Electrical Engineering and Computer Science, Queen Mary University of London*, United Kingdom.

May. 2018–Aug. 2019
Postdoctoral Researcher, *School of Electrical Engineering and Computer Science, Queen Mary University of London*, United Kingdom.

Education

Mar. 2013–Feb. 2018
PhD degree, *School of Electrical and Electronic Engineering, Yonsei University*, Seoul, Republic of Korea.

Mar. 2011–Feb. 2013
MS degree, *School of Electrical and Electronic Engineering, Yonsei University*, Seoul, Republic of Korea.

Mar. 2007–Feb. 2011
BS degree, *School of Electrical and Electronic Engineering, Yonsei University*, Seoul, Republic of Korea.

PhD Thesis

Title *A Study on the Semi- and Self-Supervised Approaches for Object Labeling*

Supervisor Prof. Kwanghoon Sohn

Research Interests

- Self-supervised visual learning
- Vision-based robot perception
- Object segmentation
- 3D image/video processing

Publications

International Journals

– Ali Shahin Shamsabadi, **Changjae Oh**, and Andrea Cavallaro, "Semantically Adversarial Learnable Filters," *IEEE Trans. Image Process., vol. 30, pp. 8075–8087, Sep. 2021.*

– Ivan Vitanov, Ildar Farkhatdinov, Brice Denoun, Francesca Palermo, Ata Otaran, Joshua Brown, Bukeikhan Omarali, Taqi Abrar, Miles Hansard, **Changjae Oh**, Stefan Poslad, Chen Liu, Hareesh Godaba, Ketao Zhang, Lorenzo Jamone, Kaspar Althoefer, "A Suite of Robotic Solutions for Nuclear Waste Decommissioning," *Robotics, vol. 10, no. 4, Oct. 2021.*

– **Changjae Oh** and Andrea Cavallaro, "View-Action Representation Learning for Active First-Person Vision," *IEEE Trans. Circuits Syst. Video Technol.,(**TCSVT**), vol. 32, no. 2, pp. 480–491, Feb. 2021.*

– Taeyong Song, Youngjung Kim, **Changjae Oh**, Hyunsung Jang, Namkoo Ha, and Kwanghoon Sohn, "Simultaneous Deep Stereo Matching and Dehazing with Feature Attention," *Int. Journ. Comput. Vis. (**IJCV**), vol. 128, pp. 799–817, Jan. 2020.*

– **Changjae Oh**, Bumsub Ham, Hansung Kim, Adrian Hilton, and Kwanghoon Sohn, "OCEAN: Object-Centric Arranging Network for Self-supervised Visual Representations Learning," *Expert Systems with Applications. (**ESWA**), vol. 125, pp. 281-292 Jul. 2019.*

– **Changjae Oh**, Bumsub Ham, and Kwanghoon Sohn, "Robust Interactive Image Segmentation using Structure-aware Labeling," *Expert Systems with Applications. (**ESWA**), vol. 79, pp. 90-100, Aug. 2017.*

– Youngjung Kim, Bumsub Ham, **Changjae Oh**, and Kwanghoon Sohn, "Structure selective depth super-resolution for RGB-D cameras," *IEEE Trans. Image Process. (**TIP**), vol. 26, pp. 4079-4091, Aug. 2017.*

– Kyuwon Kim, **Changjae Oh**, and Kwanghoon Sohn, "Non-Parametric Human Segmentation Using Support Vector Machine," *IEEE Trans. Consumer Electronics (**TCE**), vol. 63, pp.93-100, May 2017.*

– Kyuwon Kim, **Changjae Oh**, and Kwanghoon Sohn, "Personness Estimation for Real-Time Human Detection on Mobile Devices," *Expert Systems with Applications (**ESWA**), vol. 72, pp. 130-138, Apr. 2017.*

– Sunghwan Choi, Dongbo Min, Bumsub Ham, Youngjung Kim, **Changjae Oh**, and Kwanghoon Sohn, "Depth Analogy: Data-driven Approach for Single Image Depth Estimation using Gradient Samples," *IEEE Trans. Image Process. (**TIP**), vol. 24, no. 12, pp. 5953-5966, Dec. 2015.*

– **Changjae Oh**, Bumsub Ham, Sunghwan Choi, and Kwanghoon Sohn, "Visual Fatigue Relaxation for Stereoscopic Video via Nonlinear Disparity Remapping," *IEEE Trans. Broadcast. (**TB**), vol. 61, no. 2, pp. 142-153, Jun. 2015.*

– Bumsub Ham, Dongbo Min, **Changjae Oh**, Minh N. Do, and Kwanghoon Sohn, "Probability-Based Rendering for View Synthesis," *IEEE Trans. Image Process. (**TIP**), vol. 23, no. 2, pp. 870-884, Feb. 2014.*

International Conferences

– Aaron Lee Smiles, Kitti Dimitri Chavanakunakorn, Bukeikhan Omarali, **Changjae Oh**, and Ildar Farkhatdinov, "Implementation of a Stereo Vision System for a Mixed Reality Robot Teleoperation Simulator," *Annual Conference Towards Autonomous Robotic Systems*, September 2023.

– Alessandro Pighetti, Francesco Bellotti, **Changjae Oh**, Luca Lazzaroni, Luca Forneris, Matteo Fresta, and Riccardo Berta, "Investigating Adversarial Policy Learning for Robust Agents in Automated Driving Highway Simulations," *International Conference on Applications in Electronics Pervading Industry, Environment and Society*, September 2023.

- Long Tian, Andrea Cavallaro, and **Changjae Oh**, "Cluster-based 3D Keypoint Detection for Category-agnostic 6D Pose Tracking," in *IEEE Int. Conf. Image Process. (ICIP)*, Oct. 2022.

- Hengyi Wang and **Changjae Oh**, "Boosting Video Object Segmentation based on Scale Inconsistency," *IEEE Int. Conf. Multimedia and Expo. (ICME)*, Jul. 2022.

- Hengyi Wang, Chaoran Zhu, Ziyin Ma, and **Changjae Oh**, "Improving Generalization of Deep Networks for Estimating Physical Properties of Containers and Fillings," *IEEE Int. Conf. Acoust., Speech, Signal Process. (ICASSP), Grand Challenge on Audio-visual object classification for human-robot collaboration (**1st place**)*, May 2022.

- Ziyin Ma and **Changjae Oh**, "A Wavelet-based Dual-stream Network for Underwater Image Enhancement," *IEEE Int. Conf. Acoust., Speech, Signal Process. (ICASSP)*, May 2022.

- Jaehoon Cho, Jiyoung Lee, **Changjae Oh**, Wonil Song, and Kwanghoon Sohn, "Wide and Narrow: Video Prediction from Context and Motion," *British Machine Vis. Conf. (BMVC)*, Nov. 2021.

- **Changjae Oh**, Yik Lung Pang, and Andrea Cavallaro, "OHPL: One-shot Hand-eye Policy Learner," *IEEE/RSJ Int. Conf. Intell. Robots Syst. (IROS)*, Sep. 2021.

- Francesca Palermo, Liz Katherine Rincon Ardila, **Changjae Oh**, Kaspar Althoefer, Stefan Poslad, Gentiane Venture, and Ildar Farkhatdinov, "Multi-modal robotic visual-tactile localisation and detection of surface cracks," *IEEE International Conference on Automation Science and Engineering (CASE)*, Aug. 2021.

- Yik Lung Pang, Alessio Xompero, **Changjae Oh**, and Andrea Cavallaro, "Towards safe human-to-robot handovers of unknown containers," *IEEE Int. Conf. Robot and Human Interactive Communication (ROMAN)* Aug. 2021.

- Ali Shahin Shamsabadi, **Changjae Oh**, and Andrea Cavallaro, "Edgefool: An Adversarial Image Enhancement Filter," *IEEE Int. Conf. Acoust., Speech, Signal Process. (ICASSP)*, May 2020.

- **Changjae Oh** and Andrea Cavallaro, "Learning Action Representations for Self-supervised Visual Exploration," *IEEE Int. Conf. Robot. Autom. (ICRA)*, May 2019.

- Taeyong Song, Youngjung Kim, **Changjae Oh**, and Kwanghoon Sohn, "Deep Network for Simultaneous Stereo Matching and Dehazing," *British Machine Vis. Conf. (BMVC)*, Sep. 2018. (**Oral Presentation**) (**Best Science Paper Honourable Mention**)

- Jaehoon Cho, Youngjung Kim, Hyungjoo Jung, **Changjae Oh**, Jaesung Youn, and Kwanghoon Sohn, "Multi-task Self-supervised Visual Representation Learning for Monocular Road Segmentation," *IEEE Int. Conf. Multimedia and Expo. (ICME)*, Jul. 2018. (**Oral Presentation**)

- Hyungjoo Jung, Youngjung Kim, Dongbo Min, **Changjae Oh**, and Kwanghoon Sohn, "Depth Prediction from a Single Image with Conditional Adversarial Networks," in *IEEE Int. Conf. Image Process. (ICIP)*, Sep. 2017.

- **Changjae Oh**, Bumsub Ham, and Kwanghoon Sohn, "Point-cut: Interactive Image Segmentation using Point Supervision," in *Asian Conf. Comput. Vis. (**ACCV**)*, Nov. 2016.

- Youngjung Kim, **Changjae Oh**, and Kwanghoon Sohn, "Edge-Aware Image Smoothing using Commute Time Distance," in *IEEE Int. Conf. Image Process. (**ICIP**)*, Sep. 2016.

- Hyungjoo Jung, **Changjae Oh**, Youngjung Kim, and Kwanghoon Sohn, "Depth Extraction from a Single Image Based on Block-Matching and Robust Regression," in *Electronic Imaging (**EI**)*, Feb. 2016.

- Kyuwon Kim, **Changjae Oh**, and Kwanghoon Sohn, "Non-Parametric Human Segmentation Using Support Vector Machine," in *IEEE Int. Conf. Consumer Electronics (**ICCE**)*, Jan. 2016.

- Jeonghyun Seo, **Changjae Oh**, and Kwanghoon Sohn, "Segment-based Free Space Estimation using Plane Normal Vector in Disparity Space," in *Int. Conf. Connected Vehicles & Expo,* Oct. 2015.

- **Changjae Oh**, Seungchul Ryu, Youngjung Kim, Taewoong Park, Jihyun Kim, and Kwanghoon Sohn, "Sparse Edit Propagation for High Resolution Image using Support Vector Machines," in *IEEE Int. Conf. Image Process. (**ICIP**)*, Sep. 2015.

- Youngjung Kim, Sunghwan Choi, **Changjae Oh**, and Kwanghoon Sohn, "A Majorize-minimize Approach for High-Quality Depth Upsampling," in *IEEE Int. Conf. Image Process. (**ICIP**)*, Sep. 2015.

- Sunok Kim, **Changjae Oh**, Youngjung Kim, and Kwanghoon Sohn, "Structure-Aware Depth Super-Resolution Using Gaussian Mixture Model," in *SPIE Electronic Imaging (**EI**)*, Feb. 2015.

- **Changjae Oh**, Bumsub Ham, and Kwanghoon Sohn, "Visual Fatigue Prediction and Its Visualization," in *Global 3D Tech Forum,* Oct. 2013. (**Best Paper Award**)

- Ruei-Hung Li, Bumsub Ham, **Changjae Oh**, and Kwanghoon Sohn, "Disparity Search Range Estimation Based on Dense Stereo Matching," in *IEEE Int. Conf. Industrial Electronics and Applications (**ICIEA**),* Jun. 2013. (**Best Paper Award**)

- **Changjae Oh**, Bumsub Ham, and Kwanghoon Sohn, "Probabilistic Correspondence Matching using Random Walk with Restart," in *British Machine Vis. Conf. (**BMVC**),* Sep. 2012.

- Sunghwan Choi, Bumsub Ham, **Changjae Oh**, Hyon-gon Choo, Jinwoong Kim, and Kwanghoon Sohn, "Hybrid Approach for Accurate Depth Acquisition with Structured Light and Stereo Camera," in *IEEE Int. Symposium on Broadband Multimedia Systems and Broadcasting (**BMSB**),* Jun. 2012.

- **Changjae Oh**, Bumsub Ham, Hyon-gon Choo, Jinwoong Kim, Kwanghoon Sohn, "Joint Radiometric Calibration and Multi-view Matching with Ground Control Points," in *IEEE Int. Workshop on Advanced Image Technology (**IWAIT**),* Jan. 2012.

Books & chapters

- **Changjae Oh**, Alessio Xompero, and Andrea Cavallaro, "Visual adversarial attacks and defenses," in *Advanced Methods And Deep Learning In Computer Vision, Elsevier,* 2022.

Patents (South Korea)

– Taeyong Song, Youngjung Kim, **Changjae Oh**, NamKoo Ha, Hyunsung Jang, and Kwanghoon Sohn, "Apparatus and Method for Eliminating Haze using Stereo Matching Method and Deep Learning Algorithm," in *No. 10-2019-0137426,* (*Pending*)

– **Changjae Oh**, Seungchul Ryu, Youngjung Kim, and Kwanghoon Sohn, "Method and Device for Editing Moving Picture," in *No. 10-2014-0168683,* Oct. 2015.

– **Changjae Oh** and Kwanghoon Sohn, "Method and Device for Editing Image," in *No. 10-2014-0168693,* Aug. 2015.

– **Changjae Oh**, Bumsub Ham, Sunghwan Choi, and Kwanghoon Sohn, "Apparatus and Method of Processing an Image Considering Fatigue," in *No. 10-2013-0145962,* Oct. 2015.

Working Experience

Research Projects

Sep. 2019–
Dec. 2022
CORSMAL: Collaborative Object Recognition, Shared Manipulation and Learning), *The Engineering and Physical Sciences Research Council (EPSRC)*, UK.
Project member
– Vision-based perception for human-to-robot handover.

May. 2018–
Aug. 2019
Nuclear Centre for Nuclear Robotics (NCNR), *The Engineering and Physical Sciences Research Council (EPSRC)*, UK.
Project member/postdoctoral researcher
– Vision-based robot navigation for unseen environment.

Sep. 2017–
Feb. 2018
Intelligent Virtual Reality: Deep Audio-Visual Representation Learning for Multimedia Perception and Reproduction, *National Research Foundation of Korea (NRF)*, Republic of Korea and UK.
Project manager
– Collaborative research with University of Surrey, UK.

Oct. 2017–
Dec. 2018
Deep Learning-based Multi-spectral image Fusion, *LIG Nex1*, Republic of Korea.
Project member
– Developing image enhancement algorithms by multi-spectral image fusion.

Jul. 2015–
Aug. 2017
High Quality 2D–to–Multiview Contents Generation from Large-scale RGB+D Database, *Institute for Information & communications Technology Promotion (IITP)*, Republic of Korea.
Project member
– Single image depth estimation using RGBD database.

Sep. 2015–
Jun. 2016
Joint Depth and Intrinsic Image Inference for Deep Single Image Understanding from RGB-D Database, *Institute for Information & communications Technology Promotion (IITP) and Microsoft Research Asia (MSRA)*, Republic of Korea.
Project member
– Estimating scene primitives from RGB-D database using deep neural networks.

Mar. 2015– Nov. 2015	**Correspondence Matching between Images in Paired Camera**, *Samsung Electronics Co. Ltd.*, Republic of Korea. *Project manager/Software developer* – (8mm baseline) Colorization of 20M mono image using 4M RGB image. – (7–8cm baseline) Stereo matching between 5M mono using 1M RGB
Oct. 2014– Jun. 2015	**Context Analogy: Multi-modal Feature Learning for Large Scale Scene Parsing**, *National IT Industry Agency (NIPA) and Microsoft Research Asia (MSRA)*, Republic of Korea. *Project member* – Landmark recognition under severe weather conditions.
May 2014– Nov. 2014	**Fast Image Processing for DNG Viewer/Editor in Mobile Devices**, *LG Electronics Co. Ltd.*, Republic of Korea. *Project manager/Software developer* – Developing a fast DNG to RGB conversion algorithm. – Sparse edit propagation for image editing.
Nov. 2013– Sep. 2014	**2D to Multiview Conversion System**, *Samsung Electronics Co. Ltd.*, Republic of Korea. *Project member* – Reasoning a high quality range data from 2D image. – Data-driven 2D to 3D conversion scheme.
Mar. 2012– Mar. 2013	**Saliency Based Realistic 3D Representation**, *Samsung Electronics Co. Ltd.*, Republic of Korea. *Project manager/software developer* – Visual fatigue reduction based on visual attention. – Human visual system based saliency map and non-linear depth control.
Mar. 2011– Dec. 2015	**Development of Next Generation Digital TV Broadcasting System**, *Information Technology Research Center of Ministry of Knowledge Economy (ITRC)*, Republic of Korea. *Project member* – Developing core technology for 3D/4K/8K UHDTV broadcasting generation/editing.

Academic Experience

Activities

Dec. 2021	**Intelligent Sensing Winter School**, *Queen Mary University of London*, UK. Co-organiser
Sep. 2020	**Intelligent Sensing Summer School**, *Queen Mary University of London*, UK. Co-organiser
Jan. 2019	**Yonsei University and QMUL workshop on Audio and Visual Learning for Multimedia Perception and Production**, *Queen Mary University of London*, UK. Organiser

Talks

May, 2022	**Vision-based Perception for Manipulation**, *Korea University*.

Education

Nov. 2018 **DC001 - PhD Supervision Training for New Supervisors**, *Queen Mary University of London*, UK.
PhD Supervision Training

Service

SysInt 2022 (Track chair),

Reviewer

IEEE Transactions on Image Processing, IEEE International Conference on Robotics and Automation, IEEE Transactions on Industrial Informatics, IEEE Transactions on Neural Networks and Learning Systems, IEEE Transactions on Multimedia, IEEE Computer Vision and Pattern Recognition, British Machine Vision Conference, IEEE/RSJ International Conference on Intelligent Robots and Systems

Teaching

Advanced Transform Methods (2019), Image and Video Processing (2019-2021), Computer Vision (2020-2023) Interactive Media Design and Production (2020).

Teaching Assistant

Fall, 2017 **Digital Image Processing**, *Yonsei University*, Republic of Korea.

Spring, 2017 **Special Topics in Computer Vision**, *Yonsei University*, Republic of Korea.

Fall, 2013 **Graduation Research (undergraduate course)**, *Yonsei University*, Republic of Korea.
Spatio-temporal depth image filtering.

Fall, 2011 **Signals and Systems**, *Yonsei University*, Republic of Korea.

Scholarships

Sep. 2013– Software Convergence Scholarship of *Samsung Electronics co. Ltd*.
Feb. 2018

Mar. 2011– Brain Korea National Science Scholarship of *Korea Research Foundation*.
Feb. 2017