Sungjun Yoon

vujadeyoon@gmail.com
https://vujadeyoon.github.io
https://github.com/vujadeyoon
https://www.linkedin.com/in/sjyooncv
+82 1076331671

EDUCATION

Korea Advanced Institute for Science and Technology (KAIST), Daejeon, South Korea
M.S., in Electrical Engineering
GPA 3.72 / 4.3

Mar. 2016 ~ Feb. 2018

Sejong University, Seoul, South Korea
B.S., in Information and Communication
GPA 4.39 / 4.5, 1 ranked GPA in the College (Summa cum laude)

Mar. 2009 ~ Feb. 2016

KEY RESEARCH EXPERIENCE

iLab, CTO, LG Electronics

- Paper:
  - Perceptual Image Quality Assessment with Transformers, CVPRW 2021
  - NTIRE 2021 Challenge on Perceptual Image Quality Assessment, CVPRW 2021
- Award: Winner Award in NTIRE 2021 Challenge on Perceptual Image Quality Assessment, CVPRW
- Proposed an image quality transformer (IQT) that is based on the transformer architecture for a perceptual full-reference image quality assessment (IQA).

Jan. 2021 ~ June 2021

iLab, CTO, LG Electronics

- Paper: NTIRE 2020 Challenge on Image Demoireing, CVPRW 2020
- Award: Honorable Mention Award in NTIRE 2020 Challenge on Image Demoireing, CVPRW
- Proposed a multi-scale based deep residual network and a novel adaptive pointwise convolution (APC) that uses spatially variant learnable kernel weights for each pixel feature in order to solve a single image demoireing problem.

Jan. 2020 ~ June 2020

Video and Image Computing Lab, KAIST

- Paper: A Study on Hierarchical CNN based Frame Rate Up-Conversion, IPIU 2018
- Award: Best Paper Award, Image Processing and Image Understanding (IPIU) 2018
- Video frame interpolation for synthesizing frames to be interpolated using deep convolutional neural network (CNN)
- Proposed a novel CNN architecture which is called hierarchical shift-able convolution that estimates convolution kernels covering 357x357 receptive field at a time in order to handle high-speed motions.
- The proposed method can effectively solve large-scale regression problems when handling high resolution videos such as HD1080 and 4K UHD.

July 2017 ~ Dec. 2017

Video and Image Computing Lab, KAIST and SiliconWorks Inc.

- Paper: Hierarchical Extended Bilateral Motion Estimation based Frame Rate Up - Conversion using Learning based Linear Mapping, IEEE TIP 2018
- Frame rate up-conversion for synthesizing frames to be interpolated using machine learning method, kernel ridge regression
- Proposed a hierarchical extended bilateral motion estimation and a novel frame synthesizing scheme which learns a structural edge information in voxel structures between neighboring frames.
- The proposed method significantly outperforms the state-of-the-art method with average 1.42dB higher in terms of peak signal-to-noise ratio (PSNR).

Jan. 2017 ~ Sep. 2017

WORK EXPERIENCE

iLab, CTO, LG Electronics

- Have researched a Convolutional Neural Network (CNN) based face parsing (i.e. face segmentation) algorithm focusing on data imbalance among facial labels.

Nov. 2021 ~ NOW

iLab, CTO, LG Electronics

- Have developed the deep-learning based face detector and object tracker that work on Amazon Elastic Compute Cloud (Amazon EC2) (e.g. g4dn.xlarge) under the Amazon Elastic Kubernetes Service (Amazon EKS) environment.
- My role is as follows:
  - Developing and optimizing the deep-learning based face detector (e.g. RetinaFace) and object tracker (e.g. SiamRPN). (i.e. i) Applying TensorRT and AWS Neuron; ii) Model compression with Knowledge-Distillation to reduce the number of flops and GPU synchronization time for the model; iii) Converting some array operations from python to cython)
  - Developing the managed Kubernetes (e.g. Amazon EKS) to deploying the deep-learning algorithms on the AWS cloud. (i.e. i) Designing deep-learning model serving architecture; ii) Applying overprovisioning node (or placeholder node) to reduce node provisioning time; iii) Applying custom metric for HPA using KEDA)
- References:
  - https://github.com/vujadeyoon/TensorRT-Torch2TRT
  - https://vujadeyoon.gihtub.io/blog/2022/eks

June 2020 ~ NOW

iLab, CTO, LG Electronics

- Developed a solution for real-time automatic zoom utilizing facial landmarks detector based on the inception modules on the Android device using the OpenCV and the Qualcomm SNPE.

Sep. 2019 ~ Sep. 2020

Camera Research Lab, CTO, LG Electronics

- Researched and developed a real-time portrait segmentation algorithm based on the DeepLab v3 on the Android device with the Qualcomm Snapdragon 855 and Adreno 640 GPU using the TensorFlow and Qualcomm SNPE.

Oct. 2018 ~ Dec. 2019

Big Data Architect, SK

- Implemented deep learning based anomaly detection algorithm, *2018 ICLR "Deep Autoencoding Gaussian Mixture Model for Unsupervised Anomaly Detection"* using PyTorch and researched anomaly detection for time-series data such as network KPI data.

Jan. 2018 ~ July 2018

Video and Image Computing Lab, KAIST

- Implemented MATLAB built-in function, imresize(), which includes anti-aliasing filter for down-scaling and interpolation filter for image resizing such as i) nearest neighbor method, ii) bilinear, iii) bicubic, iv) lanczos2 (4-tab filter), v) lanczos3 (6-tab filter) with C language.
- Github: https://github.com/vujadeyoon/MATLAB2016b-imresize

Jan. 2018

Video and Image Computing Lab, KAIST and SiliconWorks Inc.

- Implemented Super-Resolution algorithm, *2016 IEEE TIP "Super-interpolation with edge-orientation-based mapping kernels for low complex 2× upscaling"* with C language.
- Hardware-friendly algorithm optimization considering memory bandwidth and computational complexity

Jan. 2016 ~ Feb. 2016

Human Computer Interaction Lab, Sejong University

- Implemented spectral subtraction module for noise reduction in speech signal.
- Github: https://github.com/vujadeyoon/Speech-Enhancement-Spectral-Subtraction

Dec. 2013 ~ Feb. 2014

VOLUNTEER EXPERIENCE

Volunteer staff, PyCon Korea

- PyCon Korea is a non-commercial conference held by Python Programming Communities in Korea

Aug. 2018

OPENSOURCE EXPERIENCE

Vujade

- A collection of useful classes and functions based on the Python3 for deep learning research and development including model serving.
- Github: https://github.com/vujadeyoon/vujade

Aug. 2016 ~ NOW

INTEREST

Machine learning and deep learning for computer vison and image processing
Deep-learning model serving on the edge device and managed Kubernetes.
Code refactoring

PUBLICATION

V. Ivan, I. Mistreanu, A. Leica, **S. Yoon**, M. Cheon, J. Lee, and J. Oh, "Improving Key Human Features for Pose Transfer", in *IEEE/CVF International Conference on Computer Vision Workshop (ICCVW)*, Oct. 2021, Virtual site.

M. Cheon, **S. Yoon**, B. Kang, and J. Lee, "Perceptual Image Quality Assessment with Transformers", in *IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshop (CVPRW)*, June 2021, Virtual site.

M. Cheon, **S. Yoon**, B. Kang, and J. Lee, "NTIRE 2021 Challenge on Perceptual Image Quality Assessment", in *IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshop (CVPRW)*, June 2021, Virtual site.

M. Cheon, **S. Yoon**, B. Kang, and J. Lee, "NTIRE 2020 Challenge on Image Demoireing: Methods and Results", in *IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshop (CVPRW)*, June 2020, Virtual site.

J. Lee, **S. Yoon**, J. Kim, and J. Han, "Weighted DCT-IF for Image up Scaling", in *KSII trans. on Internet and Information Systems (TIIS)*, Feb. 2019

S. Yoon, H. Kim, and M. Kim, "Hierarchical Extended Bilateral Motion Estimation based Frame Rate Up-Conversion using Learning based Linear Mapping", in *IEEE trans. on Image Processing (TIP)*, Dec. 2018.

S. Yoon, Y. Kim, and M. Kim, "A Study on Hierarchical CNN based Frame Rate Up-Conversion", in *30th Workshop on Image Processing and Image Understanding (IPIU)*, Feb. 2018, Maison Glad Jeju.

S. Yoon, and J. Han, "An adaptive scaler for UHD video", in 2015 Summer Conference on Korea *Society of Broadcasting Engineering (CKSBE)*, pp.173-176, July 2015, Jeju National University.

PATENT

Method for scaling a resolution and an apparatus thereof *(KR 10-2015-0075788 / 10-1702937)*	Jan. 2017
Method for scaling a resolution and an apparatus thereof *(KR 10-2015-0075786 / 10-1683378)*	Nov. 2016

HONORS AND AWARDS

Winner Award in NTIRE 2021 Challenge on Perceptual Image Quality Assessment, CVPRW	June 2021
Honorable Mention Award in NTIRE 2020 Challenge on Image Demoireing, CVPRW	June 2020
Best Paper Award, IPIU	Feb. 2018
National Government Scholarship, KAIST	2016 – 2017
Academic Scholarship Awards, Sejong University	2013 – 2015
Academic Scholarship Awards, Sejong University	2009

LANGUAGE

Korean – Native
English – Advanced

DATE OF PREPARATION

Mar. 4, 2022.