

# VAN-TU VO

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GitHub ([link](#)); LinkedIn ([link](#)); Google Scholar ([link](#))

## TECHNICAL STRENGTHS

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<b>Computer Languages</b>	Matlab, Python, PySpark, SQL, Bash/C Shell (Vim & Linux OS)
<b>Libraries/Tool</b>	Tensorflow, Pytorch, Scikit-learn, Pandas, Kubeflow Docker, GCP, Azure, Sagemaker, FastAPI, Streamlit, Gradio
<b>Research Focus</b>	Machine Learning/Deep Learning applied on Computer Vision, Large Language Models, Time Series Data.

## EXPERIENCE

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**Research Scientist** *March 2022 - now*  
*KC Machine Learning Lab* *Korea*

- **Low-Light Blurry Image Restoration - on going ...:**
  - Conducting Research on Image Enhancement, especially Low-Light Blurry Problem.
- **RAG based Information Retrieval - Jan 2024 - June 2024:**
  - Researched and developed **RAG**-based document retrieval system for internal documentation search. In this project, we used **LlamaFile** which is compiled to run with C++, **ChromaDB** to save feature, and **Streamlit** to run the bot.
- **Resource Constrained Vision - March 2023 - August 2023:**
  - Researched and developed a training pipeline to train a model under a given low resource.
  - Contributed to a workshop, published in ICCV 2023 Proceedings.
- **Efficient Super-Resolution - March 2022 - September 2022:**
  - Researched and developed a resource efficient model for Image Resolution Task.
  - Conducted benchmark experiments and participated in the CVPR 2022 Challenge on Efficient Super-Resolution Models.

**Machine Learning Engineer** *March 2020 - January 2022*  
*InhandPlus Inc.* *Korea*

- **Sound detection on Microchips - Time Series Data Project:**
  - Developed and deployed a sound detection model on microchips for in InhandPlus smartwatch, achieving over 97% accuracy. The model is designed to be small yet efficient to work as a trigger to turn on the camera when the patient opens the medication bag.
- **Medication taking behavior analysis:**
  - Successfully released the software to monitor the medication usage behavior of the patients which combines deep learning object detection models trained on real video data to detect objects in videos and LSTM models to analyze the action by considering videos as time-series data. The object detection models are built upon **Tensorflow Object Detection API** while action recognition models are built from scratch and updated daily using **Kubeflow on Azure**. The accuracy was more than 95% and the model was brought to cooperate with several hospitals in Korea.
- **AutoLabelling:**
  - Enhanced LabelImg with an autolabel function using trained object detection models, reducing labeling time and human resources by threefold.

**Research Assistant** *September 2016 - February 2019*  
*Department of Computer Engineering* *South Korea*

- **HDR10 Tonemapping - A Project with Samsung Electronic, South Korea (Commercial Project):**
  - The project aims to develop an optimized human visual system (HVS) response model-based tone-mapping algorithm to preserve the perceptual responses between the High Dynamic Range (HDR) image and its tone-mapped image. The algorithm was deployed on Samsung's commercial Television.

## · High Dynamic Range Video Synthesis (Research Project):

- This project aims to develop Super-pixel based motion estimation framework to estimate the motion vectors between adjacent frames under different illumination condition. The motion vectors are then used to warp the initial frames and generate the HDR video).

## PUBLICATIONS

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- Deep Joint Unrolling for Deblurring and Low-Light Image Enhancement (JUDE) - **Tu Vo**, Chan Y. Park *WACV 2025*
- NTIRE 2021 Challenge for Defocus Deblurring Using Dual-Pixel Images: Methods and Results - A Abuolaim, R Timofte, MS Brown, **Tu Vo**, ... *CVPR 2021*
- Attention! Stay Focus! - **Tu Vo** - *CVPR Workshop 2021*
- Robust HDR Video Synthesis Using Superpixel-Based Illumination Invariant Motion Estimation - **Tu Vo**, C Lee - *2018 IEEE International Conference on Consumer Electronics-Asia*
- High Dynamic Range Video Synthesis Using Superpixel-Based Illuminance-Invariant Motion Estimation - **Tu Vo**, C Lee - *IEEE Access*, 8, 24576-24587, 2020
- Optimized Tone Mapping of HDR Images via HVS Model-Based 2D Histogram Equalization - NH Nguyen, **Tu Vo**, Y Jeong, Y Moon, C Lee - *2018 Asia-Pacific Signal and Information Processing Association Annual Summit and Conference (APSIPA ASC)*, 4, 2018
- Human Visual System Model-Based Optimized Tone Mapping of High Dynamic Range Images - NH Nguyen, **Tu Vo**, C Lee - *IEEE Access*, 9, 127343-127355, 2021
- RCV2023 Challenges: Benchmarking Model Training and Inference for Resource-Constrained Deep Learning - R Tiwari, A Chavan, D Gupta, G Mago, **Tu Vo**, ... - *ICCV 2023*
- HDR Video Synthesis Using Superpixel-Based Motion Estimation - **Tu Vo**, C Lee - *Proceedings of the Korean Society of Broadcast Engineers Conference*, 90-91, 2018.

## EDUCATION

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**Pukyong National University, South Korea**  
MS in Computer Engineering

*February 2019*

## ACHIEVEMENTS

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- Top-five team ranking of **MOAI 2020 Body Morphometry Segmentation Challenge** ([link](#))
- Top-nine team ranking of **NTIRE 2021 Defocus Deblurring Challenge** ([link](#))
- Top-five *PSNR* ranking of **NTIRE 2022 High Dynamic Range Challenge** ([link](#))

## PERSONAL PROJECTS

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### Document Splitting:

- Develop an algorithm to split pdf files from a merged file. The algorithm consists of an image recognition branch and a Natural Language branch to handle both spatial and language information.

- Github link: [document\\_splitting](#)

### Zero-DCE TF:

- A Tensorflow implementation of Zero-DCE, a deep learning-based image enhancement algorithm without input-ground truth pairs.

- Github link: [Zero\\_DCE\\_TF](#)

### Attention! Stay Focus! - CVPR Workshop 2021 ([link](#))

- A deep learning model to solve the Defocus Deblurring Problem. The deep learning model is modified from the original Unet with the Attention Mechanism. This project was published on CVPRWorkshop 2021.

- Github link: [ATTSF](#)