

Woobin Im

Ph.D. candidate

SGVR Lab @ KAIST

Research interest: computer vision, optical flow estimation

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About Me

I'm a Ph.D. candidate at KAIST, South Korea. My research is focused on solving **computer vision** problems using **machine learning**. I am especially interested in **motion understanding**, so I have been working on video-related topics.

How to deal with the lack of labeled datasets is where I have expertise. I have mainly studied optical flow estimation with deep learning in an **unsupervised** or **semi-supervised** manner. Recently, I presented two optical flow papers (UnsupSimFlow and FlowSupervisor) at top-tier vision conferences; the two papers are related to unsupervised learning and semi-supervised learning, which are crucial in optical flow learning. I want to research similar topics related to motion understanding and label-efficient learning in the future.

Not only on the topics mentioned above, I'm knowledgeable about general computer vision tasks and robotics. I have implemented my code using Python, C++ with OpenCV, Tensorflow (1 and 2), and Pytorch while participating in many vision-related projects: face recognition, 3D teleportation, and multi-view line matching.

Award

- Naver Ph.D Fellowship Award, 2022.
- Finalist at Qualcomm Innovation Fellowship Korea (QIFK), 2020.

Education

- **KAIST, Ph.D., Computer Science** **2018-current**
 - Advisor: Professor Sung-Eui Yoon
- **KAIST, M.S., Computer Science** **2016-2018**
 - Advisor: Professor Hyun Seung Yang
- **Yonsei University, B.S., Computer Science** **2012-2016**

Publications

- **Diffusion Probabilistic Models for Scene-Scale 3D Categorical Data**
Jumin Lee, **Woobin Im**, Sebin Lee, and Sung-Eui Yoon
arXiv preprint, 2023
[arxiv] [github]
- **Scenario Generation by Action Scene-Graph Prediction**
Woobin Im, Woo Jae Kim, and Sung-Eui Yoon
Korea Software Congress (KSC), 2022
[web] [paper]

- **Semi-Supervised Learning of Optical Flow by Flow Supervisor**
Woobin Im, Sebin Lee, and Sung-Eui Yoon
European Conference on Computer Vision (ECCV), 2022
 [web] [arxiv] [github]
- **In-N-Out: Towards Good Initialization for Inpainting and Outpainting**
 Changho Jo, **Woobin Im**, and Sung-Eui Yoon
British Machine Vision Conference (BMVC), 2021
 [web] [arxiv] [github]
- **Self-Supervised Visual Odometry via Frame Interpolation**
 Sebin Lee, **Woobin Im**, and Sung-Eui Yoon
Korea Robotics Society Annual Conference (KRoC), 2021
 [paper]
- **Unsupervised Learning of Optical Flow with Deep Feature Similarity**
Woobin Im, Tae-Kyun Kim, and Sung-Eui Yoon
European Conference on Computer Vision (ECCV), 2020
 [web] [paper] [github]
- **Combined Center Dispersion Loss Function for Deep Facial Expression Recognition**
 Abhilasha Nanda, **Woobin Im**, Key-Sun Choi, and Hyun Seung Yang
Pattern Recognition Letters, 2020
 [paper]
- **Two-stream Spatiotemporal Feature for Video QA Task**
 Chiwan Song, **Woobin Im**, and Sung-Eui Yoon
<https://arxiv.org/abs/1907.05006>, 2019
 [arxiv]
- **Acoustic Material Estimation with Convolutional Neural Network**
 Doheon Lee, Inkyu An, **Woobin Im**, and Sung-Eui Yoon
Korea Robotics Society Annual Conference (KRoC), 2019
 [paper]
- **An Application of Convolutional-LSTM Network and Video QA**
 Chiwan Song, **Woobin Im**, and Sung-Eui Yoon
Korea Computer Congress (KCC), 2018
 [paper]
- **Scale-Varying Triplet Ranking with Classification Loss for Facial Age Estimation**
Woobin Im, Sungeun Hong, Sung-Eui Yoon, and Hyun S. Yang
Asian Conference on Computer Vision (ACCV), 2018
 [web] [paper] [github]
- **CBVMR: Content-Based Video-Music Retrieval Using Soft Intra-Modal Structure Constraint**
 Sungeun Hong, **Woobin Im**, and Hyun S. Yang
Proceedings of the ACM international conference on Multimedia Retrieval (ICMR), 2018
 [paper] [video]

- **D3: Recognizing dynamic scenes with deep dual descriptor based on key frames and key segments**
Sungeun Hong, Jongbin Ryu, **Woobin Im**, and Hyun S. Yang
Neurocomputing, 2018
[paper]
- **SSPP-DAN: Deep Domain Adaptation Network for Face Recognition with Single Sample Per Person**
Sungeun Hong, **Woobin Im**, Jongbin Ryu, and Hyun S. Yang
International Conference on Image Processing (ICIP'17), IEEE, 2017
Oral [paper]
- **Convolutional Texture Networks based on Histogram Pooling**
Jongbin Ryu, Sungeun Hong, **Woobin Im**, and Hyun S. Yang
- **Image-text multi-modal representation learning by adversarial backpropagation**
Gwangbeen Park and **Woobin Im**
arXiv preprint arXiv:1612.08354, 2016
- **Deep CNN-based Person Identification using Facial and Clothing Features**
Sungeun Hong, **Woobin Im**, Junwoo Park, and Hyun S. Yang
Jun 2016, Summer General Conference '16, IEEK, 2016

Patents

- Using Triplet-based Loss for Training Ordinal Classification Deep Models [detail]
- Partial Face Based Person Identification Across Poses [detail]

Projects

- Rendering for teleportaion in AR devices
 - Mar 2018 - Dec 2020, funded by National Research Foundation (NRF)
- Lab website renovation, Dec 2019 (sgvr.kaist.ac.kr)
- Age, gender, and expression recognition using face images
 - Dec 2016 - Feb 2018, funded by Korea Advanced Institute of Science and Technology
- Multi-view Face Recognition based on Deep Learning
 - May 2016 - May 2017, funded by Electronics and Telecommunications Research Institute (ETRI)

Experiences

- Teaching Assistants
 - GSAG-KAIST Research and Education Program, 1/2019-2/2019
 - CS206: Data Structure (Spring 2019), 3/2019-6/2019
 - CS688: Web-Scale Image Retrieval (Fall 2018), 9/2018-12/2018
 - CS101: Introduction to Programming, 9/2016-12/2017, 9/2018-12/2018
- Undergraduate Research Assistant
 - DB Lab, Yonsei University, 1/2014-2/2014