Woobin Im

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Ph.D. candidate
SGVR Lab @ KAIST
Research interest: computer vision, optical flow estimation

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.
- Outstanding Teaching Assistant Award (우수조교상), KAIST, 2019.

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**

Work

- **CLOVA, NAVER Cloud Corp. (internship)** **2023.02-2023.08**

Publications

- **Multi-resolution distillation for self-supervised monocular depth estimation**
  Sebin Lee, **Woobin Im**, and Sung-Eui Yoon
  Pattern Recognition Letters, 2023

- **Diffusion Probabilistic Models for Scene-Scale 3D Categorical Data**
  Jumin Lee, **Woobin Im**, Sebin Lee, and Sung-Eui Yoon
  Workshop on Image Processing and Image Understanding (IPIU), 2023
  Best Paper Award [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