

Zhuo Su

Postdoc Researcher in Computer Vision and Machine Learning, University of Oulu, Finland

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I am a computer vision researcher at Center for Machine Vision and Signal Analysis (CMVS) in University of Oulu, Finland. I have defended my thesis in October, 2023. My thesis topic is Efficient Representation Learning for Computer Vision, towards building real-time and compact computer vision models with deep learning. Before that, I visited the AMLab, University of Amsterdam for six months in 2021 and 2022. By April, 2023, I accomplished my 7-month internship at Intel Lab, Germany. As a Postdoc, I am now working on Generative AI and Multimodal learning projects in computer vision.

Interests : Machine Learning, Deep Learning, Computer vision, Math, Coding

PROGRAMMING

Python ● ● ● ● ●
Matlab ● ● ● ● ●
C/C++/C++.NET ● ● ● ● ○

+ TOOLS/FRAMEWORKS

Pytorch ● ● ● ● ●
Linux ● ● ● ● ●
Git ● ● ● ● ●

LANGUAGES

> English (fluent)
> Chinese (native)
> Finnish (survival)

EXPERIENCE

POSTDOC IN GENERATIVE AI AND MULTIMODAL LEARNING (OULU UNIVERSITY, FINLAND)

NOVEMBER 2023 - PRESENT

I worked on generative models based on stable diffusion and multimodal learning.

Diffusion Models Face Editing Multimodal Learning

MACHINE LEARNING INTERN (INTEL LAB, GERMANY. 7 MONTHS)

SEPTEMBER 2022 - MARCH 2023

I worked with Matthias Müller at Intel Lab, Germany, on building efficient computer vision networks. The involved tasks are real-time salient object detection and depth estimation.

Computer Vision Efficient Neural Networks Real-time Salient Object Detection Depth Estimation

VISITING RESEARCHER (UNIVERSITY OF AMSTERDAM. 6 MONTHS)

OCTOBER 2021 - MARCH 2022

ELLIS PhD & Postdoc Program AMLab

I visited AMLab under the ELLIS PhD & Postdoc Program. There, I worked with Prof. **Max Welling**, on the topic of “Binary SO(3) Equivariant Graph Neural Networks”. A paper was published at the International conference on 3D vision 2022.

Graph Neural Networks Rotation Equivariant Network Binarization

SOFTWARE ENGINEER (SAMSUNG R&D INSTITUTE CHINA-BEIJING. 3 MONTHS)

MAY 2018 - JULY 2018

I worked in the Machine learning group, on Optical Character Recognition.

Computer Vision Optical Character Recognition

SOFTWARE INTERN (AIHUJING.COM, CHINA. 4 MONTHS)

JANUARY 2018 - APRIL 2018

I worked as a computer vision intern, on Optical Character Recognition.

Computer Vision Optical Character Recognition

EDUCATION

October 2023 Ph.D, COMPUTER SCIENCE AND ENGINEERING, University of Oulu, Finland

October 2018 Thesis : LBP Inspired Efficient Deep Convolutional Neural Networks for Visual Representation Learning
Supervisor : Dr. Li Liu ; Opponent : Prof. Karen Eguiazarian ; Custos : Prof. Matti Pietikäinen

Computer Vision Network compression Binary neural networks Efficient Graph neural networks

March 2018 M.Sc, AUTOMATION SCIENCE AND ELECTRICAL ENGINEERING, Beihang University, China

September 2015 Thesis : Salient Object Detection for Single Images
Supervisors : Prof. Hong Zheng, Prof. Baochang Zhang
GPA : 3.24/4.0

Image processing Salient object detection Machine learning

June 2015 B.Sc, AUTOMATION SCIENCE AND ELECTRICAL ENGINEERING, Beihang University, China

September 2011 Topic : Pattern Recognition
GPA : 3.68/4.0

Pattern recognition Machine learning

PAPERS (FIRST AUTHOR)

1. **Zhuo Su** et al. “Boosting Convolutional Neural Networks with Middle Spectrum Grouped Convolution”, **IEEE Transactions on Neural Networks and Learning Systems (TNNLS)**, 2024
[pdf](#) github.com/hellozhuo/msgc
2. **Zhuo Su** et al. “Lightweight Pixel Difference Networks for Efficient Visual Representation Learning”, **IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)**, 2023
3. **Zhuo Su** et al. “Pixel Difference Networks for Efficient Edge Detection”, **IEEE/CVF International Conference on Computer Vision (ICCV)**, 2021 (oral presentation)
[pdf](#) github.com/hellozhuo/pidinet
4. **Zhuo Su** et al. “Dynamic Group Convolution for Accelerating Convolutional Neural Networks”, **European Conference on Computer Vision (ECCV)**, 2020 (spotlight presentation)
[pdf](#) github.com/hellozhuo/dgc
5. **Zhuo Su** et al. “BIRD : Learning Binary and Illumination Robust Descriptor for Face Recognition”, **British Machine Vision Conference (BMVC)**, 2019
[pdf](#) github.com/hellozhuo/bird-descriptor
6. **Zhuo Su** et al. “SVNet : Where SO(3) Equivariance Meets Binarization on Point Cloud Representation”, **IEEE International Conference on 3D Vision (3DV)**, 2022
[pdf](#) github.com/hellozhuo/svnet
7. **Zhuo Su** et al. “From Local Binary Patterns to Pixel Difference Networks for Efficient Visual Representation Learning”, **Scandinavian Conference on Image Analysis (SCIA)**, 2023
[pdf](#)
8. **Zhuo Su** et al. “Spatial and Temporal Difference Network for Real-time Salient Object Detection” (in submission to *TPAMI*, 2023)

PAPERS (CO-AUTHOR)

1. Chao Xiao et al. **Zhuo Su** et al. “Highly Efficient and Unsupervised Framework for Moving Object Detection in Satellite Videos”, **IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)**, 2024
2. Huali Xu et al. **Zhuo Su** et al. “Enhancing Information Maximization with Distance-Aware Contrastive Learning for Source-Free Cross-Domain Few-Shot Learning”, **IEEE Transactions on Image Processing (TIP)**, 2024
3. Zitong Yu et al. **Zhuo Su** et al. “Searching central difference convolutional networks for face anti-spoofing”, **IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)**, 2020
4. Wanxia Deng, **Zhuo Su** et al. “Deep ladder reconstruction classification network for unsupervised domain adaptation”, **Pattern Recognition Letters (PRL)**, 2021
5. Jiehua Zhang, **Zhuo Su**, Li Liu, “Median Pixel Difference Convolutional Network for Robust Face Recognition”, **British Machine Vision Conference (BMVC)**, 2021
6. Jiehua Zhang, **Zhuo Su** et al. “Dynamic Binary Neural Network by learning channel-wise thresholds”, **The International Conference on Acoustics, Speech, & Signal Processing (ICASSP)**, 2021

SCIENTIFIC CONTRIBUTIONS

TEACHING ASSISTANT, UNIVERSITY OF OULU (Prof. LI LIU)

2018 - 2022

I have been working as the teaching assistant of the course “Deep Learning” in University of Oulu in the past years.

Deep Learning Network Compression Pytorch

INVITED REVIEWER

2019 - PRESENT

Journals

TPAMI, TIP, TMM, TCSVT, Neurocomputing, PRL, CVIU, TOMM

Conferences

CVPR, ICCV, ECCV, ICME, ICASSP, ACMMM, AAI, ACCV, ICPR, PRCV