

# Zhuo Su

Ph.D Candidate in Computer Vision (about to graduate), University of Oulu, Finland

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I am a final-year PhD candidate supervised by Li Liu at Center for Machine Vision and Signal Analysis (CMVS) in University of Oulu, Finland. I have visited the AMLab, University of Amsterdam with six months from 2021. By March, 2023, I will accomplish my 7-month internship at Intel Lab, Germany. My thesis is Efficient Representation Learning in Computer Vision, towards building real-time and compact computer vision models with deep learning. I have great interests in my research area and am open to related work opportunities.

**Interests :** Deep Learning, Computer vision, Machine Learning

## PROGRAMMING

Python ● ● ● ● ●  
Matlab ● ● ● ● ●  
C/C++ ● ● ● ○ ○

## + TOOLS/Frameworks

Pytorch ● ● ● ● ●  
Tensorflow ● ● ● ● ○  
Caffe ● ● ● ○ ○

## LANGUAGES

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

## EXPERIENCE

### COMPUTER VISION 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 Deepfake Detection

### 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

Present  
October 2018

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

Thesis : LBP inspired Efficient Deep Convolutional Neural Networks for Visual Representation Learning  
Supervisor : Dr. Li Liu

Computer Vision Network compression Binary neural networks Efficient Graph neural networks

March 2018  
September 2015

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

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  
September 2011

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

Topic : Pattern Recognition  
GPA : 3.68/4.0

Pattern recognition Machine learning

## PAPERS (FIRST AUTHOR)

- Zhuo Su**, Jiehua Zhang, Longguang Wang, Hua Zhang, Zhen Liu, Matti Pietikäinen, Li Liu, "Lightweight Pixel Difference Networks for Efficient Visual Representation Learning", under review of *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)*, (submitted in October, 2022, major revision)

2. **Zhuo Su**, Wenzhe Liu, Zitong Yu, Dewen Hu, Qing Liao, Qi Tian, Matti Pietikäinen, Li Liu, “Pixel Difference Networks for Efficient Edge Detection”, **IEEE/CVF International Conference on Computer Vision (ICCV)**, 2021 (oral presentation)  
[pdf](#) [github.com/zhuoinoulu/pidinet](https://github.com/zhuoinoulu/pidinet)
3. **Zhuo Su**, Linpu Fang, Wenxiong Kang, Dewen Hu, Matti Pietikäinen, Li Liu, “Dynamic Group Convolution for Accelerating Convolutional Neural Networks”, **European Conference on Computer Vision (ECCV)**, 2020 (spotlight presentation)  
[pdf](#) [github.com/zhuoige1943/dgc](https://github.com/zhuoige1943/dgc)
4. **Zhuo Su**, Matti Pietikäinen, Li Liu, “BIRD : Learning Binary and Illumination Robust Descriptor for Face Recognition”, **British Machine Vision Conference (BMVC)**, 2019  
[pdf](#) [github.com/zhuoige1943/bird-descriptor](https://github.com/zhuoige1943/bird-descriptor)
5. **Zhuo Su**, Max Welling, Matti Pietikäinen, Li Liu, “SVNet : Where SO(3) Equivariance Meets Binarization on Point Cloud Representation”, **IEEE International Conference on 3D Vision (3DV)**, 2022  
[pdf](#) [github.com/zhuoinoulu/svnet](https://github.com/zhuoinoulu/svnet)
6. **Zhuo Su**, Matti Pietikäinen, Li Liu, “From Local Binary Patterns to Pixel Difference Networks for Efficient Visual Representation Learning”, **Scandinavian Conference on Image Analysis (SCIA)**, 2023  
[pdf](#)
7. **Zhuo Su**, Matthias Müller, Diana Wofk, Matti Pietikäinen, Li Liu, “Spatial and Temporal Difference Network for Real-time Salient Object Detection” (submitted to *IEEE/CVF International Conference on Computer Vision (ICCV)*, 2023)

## PAPERS (CO-AUTHOR)

1. Zitong Yu, Chenxu Zhao, Zezheng Wang, Yunxiao Qin, **Zhuo Su**, Xiaobai Li, Feng Zhou, Guoying Zhao, “Searching central difference convolutional networks for face anti-spoofing”, **IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)**, 2020
2. Wanxia Deng, **Zhuo Su**, Qiang Qiu, Lingjun Zhao, Gangyao Kuang, Matti Pietikäinen, Huaxin Xiao, Li Liu, “Deep ladder reconstruction classification network for unsupervised domain adaptation”, **Pattern Recognition Letters (PRL)**, 2021
3. Jiehua Zhang, **Zhuo Su**, Li Liu, “Median Pixel Difference Convolutional Network for Robust Face Recognition”, **British Machine Vision Conference (BMVC)**, 2021
4. Jiehua Zhang, **Zhuo Su**, Yanghe Feng, Xin Lu, Matti Pietikäinen, Li Liu, “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 (Dr. 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 - 2023

#### Journals

IEEE Transactions on Pattern Analysis and Machine Intelligence

IEEE Transactions on Image Processing

IEEE Transactions on Circuits and Systems for Video Technology

Neurocomputing

Pattern Recognition Letters

#### Conferences

IEEE/CVF Conference on Computer Vision and Pattern Recognition

2021-2023

IEEE/CVF International Conference on Computer Vision

2021-2023

IEEE International Conference on Multimedia and Expo

2021-2023

IEEE International Conference on Acoustics, Speech, and Signal Processing

2023

European Conference on Computer Vision

2022

AAAI Conference on Artificial Intelligence

2022

Asian Conference on Computer Vision

2020