

# LU SHILIN (卢仕霖)

B. Eng and MSc Student

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## EDUCATION

**Nanyang Technological University (NTU)**, MSc. in Communication Engineering, GPA: 4.88/5.0 Aug.2021-now

Related Coursework: Video signal processing (5.0/5.0); Advanced digital signal processing (5.0/5.0); Computer network (5.0/5.0); Digital communication systems (4.5/5.0)

**Shandong University (SDU)**, B. Eng. in Communication Engineering, GPA: 88.53/100 Sept.2017-Jun.2021

Related Coursework: Digital image processing (96/100); Advanced programming language (98/100); Object oriented programming technology (96/100); Mobile communications (97/100); Communication principles (96/100); Wireless communications (92/100)

**Technical University of Munich (TUM)**, Summer Exchange Program Aug.2019

## PUBLICATION

**S. Lu**, X. Hu, C. Wang, et al., “Copy-Move Image Forgery Detection Based on Evolving Circular Domains Coverage,” *Multimedia Tools and Applications*. (Minor Revision)  
*Available in arxiv* <https://arxiv.org/abs/2109.04381>

## PROJECTS

**Event Camera-based Action Recognition and Falling Detection** Aug.2021-now

*Supervised by Prof. Chichung Kot (Alex), Fellow of Academy of Engineering, Singapore, Fellow of IEEE and IES.*

- Reproduce, developed, trained and tested various spiking neural network (SNN) [1]-[3] under pytorch environment for action recognition.
- Derive and improve the PointNet++ [4] for action recognition accuracy and capacity.
- Explore and enforce anti-noise in the training data using motion consistency [5].

**Copy-Move Image Forgery Detection Based on Evolving Circular Domains Coverage**

Apr.2019-Jul.2020

*Submitted to “Multimedia Tools and Applications” Impact factor = 2.757 (2020)*

- An outcome from “The 14th SDU Student Research Training Program”, as Team Leader.
- Responsible for coordinating the research, paper writing, generating ideas, carrying out reviews, design of experiment and generation of code.
- Proposed a sequential combination of SIFT/LPSD, g2NN, RANSAC, with a novel Evolving Circular Domain Coverage (ECDC) for performance improvement in forgery detection tasks.
- Achieved precision of 97.96%, recall of 100% and  $F_1$  score 98.97%.
- The method is compared and shows advantage over 9 other state-of-art methods.

**Fragile Watermark Algorithm for Tampered-pixels Localization**

Jun.2020-Jul.2020

- Designed a fragile watermark algorithm for tamper-pixels localization task.
- Implement a watermark insertion algorithm for experiment simulation.
- Provide a possible solution for protecting image integrity.

## **Mobile Communication Course Project**

Mar.2020-Jun.2020

- Studied and reproduced the dynamic service migration in Mobile Edge Computing (MEC) based on Markov decision process [6].
- Optimized one-dimensional Markov Decision Process (MDP) by solving the Long-Term Expected Discounted Sum Cost (LDSC) in the MEC model.

## **Develop a Java based Database Application**

Nov.2019-Jan.2020

- Design course requirement. Java-based Grade Inquiry Management System.
- Achieve automation in inquiry and modification of the grade database, including read, write, ranking and abnormality detection.

## **Explore terASIC ALTERA FPGA**

May.2019-Jun.2019

- Explore frequency-based algorithm using VHDL.
- Achieve control of LEDs based on clock and hence controllable Hex number display on LED segment displays.

## **Honors & Rewards**

SDU Excellent Student Scholarship	2017-2020
SDU Final Year Project Best Paper Award in communication engineering (2021)	Jun.2021
Second honor in the 14th SDU Student Research Training Program	Jul.2020

## **INTERNSHIP**

<b>China Mobile, Quanzhou Branch, Intern at Internet Dept. (Vacation Intern)</b>	2018-2020
• Assisted in solving network signal problems, such as no signal, weak signal, and SIM cards problems. (15 weeks in total)	

## **LANGUAGE & COMPUTER**

English	IELTS 6.5
Computer Certificate	National Computer Rank, Grade Two
Programming Language	Skillful at C, C++, JAVA, MATLAB & familiarized with Python, Pytorch, SQL
Software	Skillful at Visual Studio, MATLAB, Office & familiarized with Latex, Ubuntu, Quarter II, Eclipse, Multisim

## **Reference List**

- [1] W. Fang, Z. Yu, Y. Chen, T. Masquelier, T. Huang, and Y. Tian. "Incorporating learnable membrane time constant to enhance learning of spiking neural networks," in proc. of the IEEE/CVF International Conference on Computer Vision (ICCV), pp. 2661–2671, 2021.
- [2] W. Fang, Z. Yu, Y. Chen, T. Huang, T. Masquelier, and Y. Tian. "Deep Residual Learning in Spiking Neural Networks." arXiv preprint arXiv:2102.04159 (2021).
- [3] Ali Samadzadeh, Fatemeh Sadat Tabatabaei Far, Ali Javadi, Ahmad Nickabadi, and Morteza Haghir Chehreghani. "Convolutional Spiking Neural Networks for Spatio-Temporal Feature Extraction." arXiv preprint arXiv:2003.12346 (2020).
- [4] Q. Wang, Y. Zhang, J. Yuan, et al. "Space-time event clouds for gesture recognition: From RGB cameras to event cameras." in Proc. IEEE Winter Conference on Applications of Computer Vision (WACV), Waikoloa Village, HI, USA, 2019, pp. 1826-35.
- [5] Y. Wang, B. Du, Y. Shen, et al. "EV-gait: Event-based robust gait recognition using dynamic vision sensors." in Proc. IEEE/CVF Conference on Computer Vision and Pattern Recognition, Long Beach, CA, USA, 2019, pp. 6351-60.
- [7] S. Wang, R. Urgaonkar, M. Zafer, et al. "Dynamic service migration in mobile edge computing based on Markov decision process.", IEEE/ACM Transactions on Networking, vol. 27, no. 3, pp. 1272-88, Jun. 2019.