

# Chengcheng Liu

Email: liuchengcheng\_xj@stu.xjtu.edu.cn/chengcheng.liu3@unibo.it

## Research Interests

My research interests are focused on developing computer vision and deep learning algorithms for biometrics, security and privacy protection. Currently I am researching on morphing detection, anti-spoofing attack detection and biometric template protection. Over the past 2 years, I have also worked extensively on hardware deployment of biometric algorithms.

## Education

<b>Xi'an Jiaotong University (XJTU)</b> Ranking (1/103)	Ph. D. Candidate	Sep 2019 – Jun 2025
<b>University of Bologna (Unibo)</b> Under the grant of China Scholarship Council	Visiting Student	Oct 2023 – Oct 2024
<b>Shandong University (SDU)</b> Ranking (15/121)	B.Eng.	Sep. 2015 – Jun 2019

## Awards and Honors

National Scholarship Award (TOP 1%)	2020
Samsung Electronics Scholarship Award (TOP 1%)	2021
Hubaosheng Scholarship Award	2022
Excellent Postgraduate of XJTU	2020
Outstanding Graduates of SDU	2019

## Publications

- [1] **C. Liu**, M. Ferrara, A. Franco, G. Borghi and D. Zhong, "Differential Morphing Attack Detection via Triplet-Based Metric Learning and Artifact Extraction", IEEE BIOSIG, Oct 25-27, 2024 Darmstadt, Germany. (**ORAL** Presentation)
- [2] **C. Liu**, D. Zhong and H. Shao, "PalmSecMatch: A data-centric template protection method for palmprint recognition", in Displays, 2024.
- [3] **C. Liu**, D. Zhong and H. Shao, "Data Protection in Palmprint Recognition via Dynamic Random Invisible Watermark Embedding", IEEE T-CSVT, 2022.
- [4] **C. Liu**, D. Zhong and H. Shao, "Few-shot Palmprint recognition based on Similarity Metric Hashing Network", in Neurocomputing, 2021.
- [5] **C. Liu**, H. Shao, D. Zhong and J. Du, "Siamese-Hashing Network for Few-Shot Palmprint Recognition", in IEEE SSCI, Dec 6-9, 2019 Xiamen, China.
- [6] A. Franco, Matteo Ferrara, **C. Liu**, C. Busch, D. Maltoni, On the Impact of Face Image Quality on Morphing Attack Detection, IEEE IJCB, Sep 15-18, 2024 New York, USA.
- [7] Y. Zou, **C. Liu**, H. Shao and D. Zhong, "Unsupervised Palmprint Image Quality Assessment via Pseudo-Label Generation and Ranking Guidance", in IEEE T-IM, 2023.

## Future Work

- Anti-spoofing detection for palmprint recognition via extraction of discriminative texture spoofing cues.
- Soft biometric fading algorithm for palmprint images.

## Skills and Project

Program	<b>Language:</b> C/C++, Python, MATLAB script <b>Others:</b> cross compiler, deploying deep learning algorithms on embedded platforms.
Hardware	<b>MCU/SoC:</b> STM32, 51, Rockchip. <b>OS:</b> Ubuntu/Linux/Win
Project	<b>1. Palmprint recognition embedded module, the module has been delivered (2021-2022).</b> Core works: deploy deep learning algorithms, define communication protocols, build business logic, build encryption systems and compose software and hardware authorization systems. <b>2. Highway lawn mowing robot, I was honored the <i>President's Special Contribution Award</i> (2018).</b> Core works: design and deployment of control algorithms. Independently develop the core code and contribute the first generation of robot control scheme for the internship company.

## Association Work

2020.06 - 2021.06	Officers of the Graduate Student Association of the Faculty of Electronics and Information Science of Xi'an Jiaotong University
2016.11 - 2018.06	Members of Shandong University's <i>Geek Bird</i> volunteer service team, repairing computer problems for teachers and students for free.