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| **Lanqing Yang** | | | | |  |
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| **Research Area: Mobile Computing (Computer Science)** | | | | |
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| **Education** | | | | **Graduation: 2022.12** |

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| **Shanghai Jiao Tong University** | | 09/2017-Now |

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| Ph.D. Candidate, Department of Computer Science |

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| **University of Electronic Science and Technology of China** | 09/2013-06/2017 |

Undergraduate, Department of Software Engineering

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| **Research Projects** | | |  | | |  |
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| **Research on Remote Attack on Speech Recognition Systems** | | | | 04/2020-Now | | |
| **•** | Targeting at attacking on existing SR systems remotely using sounds from nearby power supply. | | | | | | |
| **•** | Led a team of 3 teammates. Experimented CPU modulation schemes to generate human-like sounds, analyzed spectrograms from mobile devices, and employed reinforcement learning to learn CPU modulation parameters adaptively. | | | | | | |
| **•** | Implemented on 10 commercial SR systems, achieved the attack 23 meters away. Corresponding paper is under review of USENIX SECURITY. | | | | | | |
| **Research on Stealthy Data Leakage in Air-gapped Computers** | | | | | 07/2021-02/2022 | | |
| **•** | Targeting at stealing privacy data from air-gapped (e.g., unconnected to internet) computers. | | | | | | |
| **•** | Led a team of 2 teammates. Experimented on how different CPU modulation factors affect the overall transmission speed. Designed a transmitter and decoder to implement the system. Designed an error correction scheme basing on observations that different frequency bands differ in signal strength and response speed. | | | | | | |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | **•** | | Implemented on commercial mobile devices. Achieved a speed of 2,400 bps, outperformed existing SOTA works by 20x. Corresponding paper has been submitted to INFOCOM 22’. | | | | **Research on Appliance Interaction with Appliances Using Mobile Devices** | | | | 07/2020-05/2021 | | **•** | | Targeting at interacting with home appliances using mobile devices (e.g., mobile phones, smart watches) without extra hardware or hardware modifications. | | | | **•** | | Led a team of 4 teammates. Surveyed the principles of Switching-mode power supply (SMPS), and where the sounds were from. Analyzed the SMPS circuit and proved both different appliances and working states could reflect on collected sounds. Implemented a system to interact with appliances with their SMPS. | | | | |  |  |  | | --- | --- | --- | | **•** | Experimented on 100 commercial appliances. Achieved an identification F1 score of 95%. Corresponding paper has been submitted to MobiSys 22’. | | | **Research on Continuous User Fingerprinting using Electromagnetic (EM) Signals** | | 05/2018-05/2020 | | **•** | Targeting at implementing continuous app/user fingerprint on mobile devices using EM signals. | | | **•** | Collected EM signals with DIY magnetic sensors and surveyed how user operating habits can be affected on EM signals. Designed a scheme to preprocess human movement noises, a FCN-LSTM classifier to identify users. | | | |  |  |  | | --- | --- | --- | | **•** | Conveyed a user study involving 30 volunteers. Achieved an identification F1 score of 97%. Corresponding paper has been published in INFOCOM 20’. | | | **Research on Non-local Convolutional Neural Networks** | | 02/2019-03/2022 | | **•** | In many multi-channel (spatial-temporal) time series scenarios (e.g., multi-sensor physiological signals analysis), it’s impossible to hold the non-local assumption for CNN. This project targets at proposing new CNN frameworks. | | | **•** | Designed a local-connection mining scheme to extract the spatial-temporal relationship, a spatial-temporal reconstruction scheme to reconstruct the relationship, and a feature extraction scheme to use the relationship. | | | |  | | --- | | **Skills** | | | | | **•** | Good knowledge of Signal Processing, Machine Learning, Nature Language Processing | | | **•** | Skilled in Python, Tensorflow, Matlab, Spark, Nosql Database and data visualization; | | | | | | | | | | | | | | | | | |
| **Awards** | | | | | | | |
| **•** | Certificate of Participate in Outstanding Youth Paper Award. 2020/7 | | | | | | |
| **•** | Second Prize of National College Green Computing Competition. 2018/11 | | | | | | |