Tao Ruijie

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EDUCATION

***PhD student*, National University of Singapore** 07/2019 - Today
- Electronic and Computer Engineer
- ***NUS Research Scholarship***
- *Supervisor: IEEE Fellow, Prof Li Haizhou*

***M.Sc*, National University of Singapore** 07/2018 - 07/2019
- Electronic and Computer Engineer
- CAP: ***4.8/5.0***, *highest distinction*
- *Supervisor: IEEE Fellow, Prof Guo Yongxin*

***B.Eng*, Soochow University** 09/2014 - 06/2018
- Electronic Engineer
- GPA:***3.8/4.0***, *the top 3% of the department*

RESEARCH INTERESTS

- ***Audio-visual Speaker Recognition***
- ***Audio-visual Speaker Diarization, Speech Separation***

NEWS

- I pass the CQE in 2020/12/11! 2020/12
- Finish the TalkNet, active speaker detection model. 2020/11
- Give up ICASSP, try to make ACM MM 2021. 2020/10
- I start to do experiments for audio-visual ASD for ICASSP. 2020/08
- My first paper has received in InterSpeech 2020, Shanghai. 2020/07
- I attended ASRU 2019 and SRE19 workshop in Santosa, Singapore. 2019/12
- I join in HLT group lead by IEEE fellow, Prof Li Haizhou. 2019/11
- My supervisor, IEEE fellow, Prof Lim Tengjoon leave NUS. 2019/10
- Start my PhD study, machine learning in network layer. 2019/07

PUBLICATIONS

- **Ruijie Tao**, Rohan Kumar Das and Haizhou Li, "Audio-visual Speaker Recognition with a Cross-modal Discriminative Network", in Proc. Conference of the International Speech Communication Association (INTERSPEECH), Shanghai, China, October 2020.
- Rohan Kumar Das, **Ruijie Tao**, Jichen Yang, Wei Rao, Cheng Yu and Haizhou Li, "HLT-NUS Submission for 2019 NIST Multimedia Speaker Recognition Evaluation", in Proc. Asia-Pacific Signal and Information Processing Association (APSIPA), Auckland, New Zealand, December 2020.

RESAERCH EXPERIENCE

Audio-visual speaker recognition with a discriminative cross-modal recognition system

Audio-visual Speaker Recognition 01/2020 - 04/2020
- Use the cross-modal recognition network to improve the single speaker recognition and face recognition system
- Use the cross-modal recognition network to improve the audio-viusal speaker recognition system.
- Have submitted the paper for INTERSPEECH 2020.

SRE19 multimedia challenge
Audio-visual Speaker Recognition 11/2019 - 12/2019

- Do speaker recognition for the audio and video part
- Try Retinaface to do face detection and Insightface to do face recognition. Get a good performance.
- Try X-vector based speaker recognition.

Deep Learning based packet routing algorithm in wireless communication
Deep Learning(DRL, CNN, GNN), Routing 07/2019 - 10/2019

- Use the deep leanring method to get the routing table for each router.
- Try GNN and DNN to deal with the routing problem. Use the global traffic patterns as the input, the next hop information as the output.

Optimization for feature extraction algorithm based on CNN and GPU
Deep Learning, Computer Vision 08/2018 - 05/2019

- The traditional way is to compute the features one by one, I use CNN on GPU to extract the features at the same time to save time.(Ubuntu)
- Modify ORB feature extraction algorithm to fit CNN based on Tensorflow in Linux system. (Python, C++)

Deep learning based indoor localization using smartphone speaker's sound
Deep Learning, Voice signal Processing 12/2018 - 04/2019

- Use the speaker on smartphone as the localization sensor
- Code the Java program based on Android system, and use the speaker to send the inaudible voice to realize Indoor/Outdoor detection based on CNN.

The software system for the Near Field Communication module
NFC, Software 01/2018 - 05/2018

- Use stm32l4 to test the NFC chip based on ios14443 protocol

The software programming for skew and pen-gripping detection
3D printer, Hardware, Software 09/2017 - 01/2018

- Use stm8s and six-axis sensor to detect the position of smart brush

The software part for three-phase inverter based on PID algorithm
Power system, Software 06/2017 - 09/2017

- Code the programme based on PID to build the three-phase inverter system.

The design of voice-controlled driving car based on embedded system
FPGA, ASR, Software 09/2016 - 12/2016

- Code the Automatic Speech Recognition(ASR) module based on mcu and FPGA to achieve the voice-controlled driving car.

SKILLS

Programming and Ability

- Be familiar with Python, C/C++, Java and Matlab.
- Be familiar with ML knowledges like DNN,CNN,RNN,DRL,SVM,GAN...
- Also have strong electronic and hardware background.

Tools

- CS: Jupyter/CLion/IDEA/PyCharm/OpenCV/Linux(Ubuntu)
- ML: Tensorflow/Keras/Pytorch
- EE: Keil/IAR/Multisim/Altium Designer/Vivado/Quartus/Modelsim/Matlab
- Others: Origin/Latex

EXPERIENCE INTERNSHIP

Visiting Student 08/2015 - 09/2015
Cambridge University, UK

Software Engineer(Internship) 01/2018 - 05/2018
Fusens Technology Company, Suzhou, China

Final Year Project Student 09/2017 - 05/2018
NUS (Suzhou) Research Institute, Suzhou, China

SELECTED HONORS

PhD Lifetime

NUS Research Scholarship	2019 - 2023

B.Eng Lifetime

The First Prize Scholarship(top 5%/300)	2015,2016,2017
Zhu Jingwen Scholarship (top 3%/300)	2016
The First Prize Comprehensive scholarship	2015,2016,2017
The First Prize for Innovation and Excellence	2016
The Individual scholarship for Researching and Innovation	2017
The Excellent scholarship for undergraduate foreign exchange programs	2015

SELECTED AWARDS

National

National Undergraduate Electronic Design Contest(top 16%/900)	The First Price
National Software and Skills Contest(top 1%/2000)	The First Price
National Training Programs for Innovation(top 13%/150)	National Excellence

Provincial

"Samsung Cup" Electronic Software Skills Contest	The First Price
Southeast University's FPGA Invitational Contest	The Third Price
National Software and Skills Contest(Embedded Software)	The Second Price

M.Sc/PhD MODULES

2018-2019 Semester 1

EE5101 Computer Control Systems	5/5
EE5101 Linear Systems	4.5/5
EE5110 Special Topics in Automation and Control	4.5/5

2018-2019 Semester 2

EE5934 Deep Learning	5/5
EE5003 Electrical Engineering Project	5/5
EE5904 Neural Networks	4.5/5
EE5907 Pattern Recognition	4.5/5

2019-2020 Semester 1

EE6310 Communication Networking Fundamentals (Advanced)	4.5/5

2019-2020 Semester 2

EE5134 Optical Communications and Networks	4/5

2020-2021 Semester 1

EE6733 Advanced topics on vision and machine learning

TEACHING

2019-2020 Semester 2

EE5132 Wireless and Sensor Networks	59 hours

2020-2021 Semester 1

EE3801 Data Engineering Principles	119 hours

2020-2021 Semester 1

EE5132 Wireless and Sensor Networks