

MR. Bangyu Lan

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RESEARCH INTERESTS

Intelligent Robotics, Raw Signal Processing and Interpretation, Computer Vision, Sequential Model, Multimodal Machine Learning, Generative Models, Cognitive Science.

EDUCATION

UNIVERSITY OF TWENTE

Enschede, Netherlands

Master of Electrical Engineering (Robotics and Mechatronic track)

Sept. 2022 to June 2024

Modelling and Simulation, Dynamics and Kinematics, Systems Engineering, Control System, Tele-presence Robotics.

- **GPA:** 7.5/10
- **Thesis:** *Deep learning-based interpretation and analysis of ultrasound raw data.* (supervised by [Dr. Niu Kenan](#))

ROCHESTER INSTITUTE OF TECHNOLOGY

Rochester, U.S.A.

Ph.D. of Computing and Information Sciences

Sept. 2021 to June 2022

Computer Vision and Image Processing, Machine Learning, Deep Learning on Multi-Modality (Audio and Video).

- **Ph.D. student (dropped)**, supervised by [Dr. Yu Kong \(M.S.U\)](#) and [Dr. Matthew Wright \(R.I.T.\)](#)
- **Research Potential Assessment Report:** *Spontaneous Facial Motion Controllable Talking Face Generation.* (Passed in the first year)

HARBIN INSTITUTE OF TECHNOLOGY, WEIHAI

Shandong, China

Bachelor of Electronic Information Engineering

Sept. 2016 to June 2020

Calculus, Analog and Digital Electronic Technology, Signals and Systems, DSP, FPGA, Satellite Positioning, etc.

- **GPA:** 89.85/100
- **Rank of Major courses:** 12/116
- **Thesis:** *Class check-in system based on collective face recognition.* (Outstanding Undergraduate Thesis)

ARTICLE RECORD

- *Deep Learning based acoustic measurement approach for robotic applications on orthopedics.* **First author.** Under review at ICRA 2023.
- *SIRC-UNet: Improving Bone Tracking Precision of A-mode Ultrasound Signals by Decoding Hierarchical Resolution Features.* **First author.** Under review at IEEE Sensor Journal.
- *Spontaneous facial motion generation by disentangling freeform visual attributes.* **First author.** Rejected by WACV 2023.
- *Re-finding the value of deep learning technology from a mathematical point of view.* **the Special Prize.** HIT Haite College Student Academic Forum 2018.

PROFESSIONAL ACTIVITIES

Reviewers for the following Conferences:

- ICRA 2023, ICCV 2022, CVPR 2022, AAAI 2022, ACM MM 2022.

Teaching Assistant for the following courses:

- CSCI-631, Foundations of Computer Vision, Spring 2022 (in Rochester Institute of Technology)

PROJECT HIGHLIGHTS

Improve Bone Tracking Precision of A-mode Ultrasound Signals

Enschede, Netherlands

Researcher, Supervised by [Dr. Niu Kenan](#)

20 hours/week, 30 weeks, 2023

Key Words: *A-mode ultrasound, dynamic bone tracking, deep learning, peak detection, SIRC-UNet*

- Develop a more advanced SIRC-UNet to detect the bone reflection peaks from the raw ultrasound signals.
- Propose the Sampling-based Proposal mechanism and a complete framework for peak detection using two UNet.
- The results prove that it can recognize and detect peaks from a local lower extremity segment.

Generate Realistic Deepfake Videos Only Based Audio

Rochester, U.S.A.

Researcher, Supervised by [Dr. Yu Kong \(MSU\)](#) and [Dr. Matthew Wright \(RIT\)](#)

40 hours/week, 60 weeks, 2022

Key Words: *Multimodal Generation, Attributes Disentanglement, VAE, Modulated Convolved Generator*

- Propose multiple attributes disentanglement methods to extract visual features from audio.
- Incorporate probabilistic sampling strategy to traditional audio-visual mappings process to bring diversity.
- Propose the first method to generate spontaneous facial motion in Deepfake, surpass previous SOTAs.

Class Check-in System Based on Face Recognition

Shandong, China

Engineer, Facial Recognition algorithm, Image Super-resolution, Network Finetune

30 hours/week, 20 weeks, 2020

- Program the class check-in system and recognize the attending students by only one picture in low resolution.
- Reengineer at least 20 algorithms and open sources to establish a sign-in system that can overcome problems in reality.
- Won the first prize in 2019 'Goertek's Cup' and the second prize in 2019 'Principal's Cup' Competitions.

Research on the Best Solution for Optimal Power Allocation Based on Reinforcement Learning

Shandong, China

Assistant Researcher, Reinforcement Learning, Tensorflow

40 hours/week, 4 weeks, 2018

- Try to find the best solution for optimal power allocation and tried neural network methods.
- Researched and applied the reinforcement learning such as DQN, DDPG, policy gradient, etc. in the project to resolve problems such as discrete data and continuous data, randomness in the operation, etc.

Research of Cognitive Learning on High School Students' Learning Proficiency

Shandong, China

Director, Metacognition, Cognitive Psychology

15 hours/week, 20 weeks, 2017

- Took charge of the whole process of the designing and team management in the cognitive learning method design.
- Applied and integrated theories of cognitive psychology and learning method to create Cognitive Learning Method.
- Find connections between cognitive psychology and machine learning (the representations and generalization).

INTERNSHIP

Radboud University Medical Center (Radboud UMC)

Nijmegen, Netherlands

Assistant Researcher, Total Knee Replacement Arthroplasty, peak detection, CasAtt-UNet

40 hours/week, 14 weeks, 2023

- Build a Deep Learning based acoustic measurement approach for robotic applications on orthopedics.
- Generate exact bone locations (depth) from the motion tracking system based on the optical markers.
- Develop CasAtt-UNet to have high accuracy for peak detection compared to the traditional methods.

Guangdong Sanweijia Information Technology Co., Ltd.

Guangdong, China

Algorithm Intern, pix2pixHD, pix2pix, GAN

40 hours/week, 4 weeks, 2020

- Build a coloring system based on pix2pixHD model to solve problems in coloring the ceramic tile with black profile.
- Adopt other methods to optimize the coloring algorithm and achieve different results, including jump connections in the Generator Network, loss function modification, adopting the Single-color-encode-RGB instead of traditional way.

China DN Information Security Co., Ltd.

Guandong, China

Internet Security Intern Engineer: Python, Chatterbot, MongoDB

40 hours/week, 4 weeks, 2017

- Designed the testing platform Athena 0.1.1 that could: generate training data, chatbot training, inference, and testing.
- Applied python chatterbot api to encapsulate interface and provide mutual test to verify and calculate accuracy.
- Composed a software manual for users in the company.

ACHIEVEMENT

HIT Outstanding graduate

Shandong, China

Officially rewarded by Committee of Harbin Institute of Technology

June 2020

H prize in MCM/ICM

Shandong, China

Matlab, Expert System, Neural Network, Multiple Linear Programming, GIS, Investment Finance Model

Feb. 2018

Scholarships

Shandong, China

1st (two times), 2nd (one times), 3rd (three times) Level People's Scholarship

Sept. 2016 to June 2020

SKILLS

Language: Chinese (native language), English (proficiency: TOFEL 104, GRE 330), Dutch (A1)

Programming: Python, Matlab, C++, C, Latex

Frameworks: Pytorch, TensorFlow,

Hobbies: Swimming, Tennis, Table Tennis, Cooking, Guitar (beginner)