Linsheng He

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Work/Intern/Volunteer Experience

The University of Alabama **Tuscaloosa, AL**
Graduate Research Assistant | SSS Lab | College of Engineering *Aug 2020 - present*
- Research on deep learning-based telecommunication objects trajectory and direction antennas topology prediction,
- Simulate Unmanned Aerial Vehicle (UAV) information by distributed deep reinforcement learning (DRL) in OSI muti-layers.

The University of Alabama **Tuscaloosa, AL**
Graduate Teaching Assistant | Digital Logic course | College of Engineering *Aug 2021 - present*
- Work as a laboratory manager, helping students to learn digital logic circuits using Quartus and breadboards.

University of Oklahoma **Norman, OK**
Researcher | Computer-Aided Diagnosis Lab | College of Engineering *May 2019 - Aug 2020*
- Developed models of medical image processing in deep neural networks and assist diagnosis by Python,
- Integrated a local medical image database by directions and labels using the database management method.

University of Oklahoma **Norman, OK**
Graduate Research Assistant | Computer-Aided Diagnosis Lab | College of Engineering *Aug 2018 - May 2019*
- Researched on breast tumor classification, brain tissue segmentation, and pathology detection projects.

Northeast Petroleum Pipeline Co., LTD. **Changchun, China**
Internship | Changchun Communications Station *Jun - Aug 2016*
- Worked on maintenance of STI frequency meter and network equipment in the operation center,
- Conducted training of the emergency handling operation according to the emergency manual at the base station.

Agape Family Life House **Langfang, China**
Volunteer *Feb - Mar 2015*
- Made a promotion video *[YouTube]* introducing the children with osteogenesis imperfecta (OI), in A.F.L.H.

Publications

Deep Neighbor Adaptation (DNA)-based Terahertz Medium Access Control (MAC) for Highly Dynamic Airborne Networks
L. He, F. Hu, Z. Chu, J. Zhao, N. Abuzaninab, Y. Sagduyu, N. Thawdar, and S. Kumar *Paper Under Reviewing [PDF] [CODE]*

Bubble Routing: Intelligent Terahertz (THz) Data Forwarding Over Flying Ad-Hoc Network (FANET) with High Mission/Mobility Dynamics
Z. Chu, F. Hu, **L. He**, J. Zhao, N. Abuzaninab, Y. Sagduyu, N. Thawdar, and S. Kumar *Paper Under Reviewing [PDF]*

Novel Framework-Based Routing for Task-Adaptive Mobile Networks of Unmanned Aerial Vehicular
Chu, Z., Ye, Z., Zhao, J., **He, L.**, & Rasheed, I. (2022). *Electronics*, 11(3), 425. *[PDF]*

IDRiD: Diabetic retinopathy–segmentation and grading challenge
Porwal, P., Pachade, J., Bae, W., ... & Meriaudeau, F. (2020). *Medical image analysis*, *59*, 101561. *[PDF]*

Projects

Distributed DRL based Multi-agent MAC layer Directional Antenna Flow Control
Ph.D. research [CODE] *Dec 2021 - present*
- Visualize a canvas grid to hold the multi-agent nodes in the MAC layer networks,
- Apply the state-of-art DDRL algorithms and defined the throughput, delay, buffer size as the rewards,
- Create a novel MAC layer protocol after analyzing the simulations from the system.

Deep Neighbor Adaptation (DNA)-based Terahertz Medium Access Control (MAC) for Highly Dynamic Airborne Networks
Ph.D. research | Paper Under Review [PDF] [CODE] *Aug 2020 - Dec 2021*
- Built a predictive network status estimation model through Graph Convolutional Networks (GCN), LSTM and GAN,
- Proposed a nested DRL with outer/inner loops for antenna actions selection,
- Proposed and completed a THz MAC protocol simulation that considers the routing context and dynamic topology.

Bubble Routing: Intelligent Terahertz (THz) Data Forwarding Over Flying Ad-Hoc Network (FANET) with High Mission/Mobility Dynamics
Ph.D. research | Paper Under Review [PDF] *Aug 2020 - Oct 2021*

- Built a mission-oriented high node mobility THz network routing scheme in the flying ad-hoc networks (FANET),
- Proposed to use GCN+LSTM+GAN to accurately predict when each bubble's node/link changes,
- Simulated congestion-aware and intra-/inter-bubble telecommunication by the concept of the traffic heat map.

Novel Framework-Based Routing for Task-Adaptive Mobile Networks of Unmanned Aerial Vehicular
Ph.D. research *Aug 2020 - Aug 2021*
- Maintained a smooth topology transformation and minimize the position changes, during shape change,
- Designed a protocol that provides a network multi-center election and member control and creates a stable and reliable MANET framework extraction algorithm that aids in routing table generation.

Implementation of Tencent TARS Microservice Deployment RPC Framework and Website Developing
Tencent challenge project [Bilibili] [CODE] *Mar - Apr 2020*
- Launched and deployed own developed bookmark website via Tencent TARS microservice deployment RPC framework.

Implementation and Comparison of DUMAS Data Integration Algorithm in PostgreSQL Management System
Course project [YouTube] [Bilibili] | Advanced Database Management *Mar - Apr 2019*
- Connected and integrated two different databases to reproduce duplicate detection and matching by PostgreSQL.

Regression and Classification of Breast Cancer Depicting on Digital Pathology Images Using CNNs
Master's degree thesis [PDF] | Defended in 2019 Spring | SPIE 2019 challenge | Ranked top 20% *Oct 2018 - Apr 2019*
- Compared and Integrated the CNN algorithm and performed threshold analysis on different regression functions,
- Implemented GAN to improve the overfitting of the competition verification set caused by too few testsets, improper data enhancement, and uneven distribution of the dataset.

Automated Segmentation of Prostate Structures by Using V-Net in MRI
Course project [YouTube] [Bilibili] | Artificial Neural Network *Mar - May 2018*
- Implemented V-Net in TensorFlow and performed segmentation prediction on 3-D prostate images in ITK-SNAP.

Methods for Brain Tissue Segmentation in CT Images
Course project [YouTube] [Bilibili] | Computer Vision *Mar - May 2018*
- Segmented the 3-D brain tissue automatically by implementing thresholds and region growing method in MATLAB.

Applying U-Net for Retinal Lesion Segmentation
ISBI 2018 IDRiD challenge, sub-challenge one | Ranked 4th out of 22 submissions [PDF] *Jan - Mar 2018*
- Classified four types of early detection of retinopathy from the fundus image,
- Used two U-Net superposition algorithms to fine-tune the parameters according to different thresholds,
- Added segmented lesion area to fine calibrate the lesion classification results.

Design of Room Temperature Control Ventilation System Based on Internet of Things
Bachelor's degree thesis | Defended in 2017 Spring *Apr - Jun 2017*
- Controlled the microcontroller in C and automatically respond to different situations and updated information to users,
- Developed a mini application in WeChat to control the temperature, humidity and light switches through using the smart phone remotely.

Education

The University of Alabama **Tuscaloosa, AL**
Ph.D. | Supervised by Professor Fei Hu | College of Engineering *Aug 2020 – Dec 2023 (Expected)*
- GPA: 3.83/4.0
- Main courses: Data Science, Optimal Control, Cyber Security, Applied Statistical Methods

University of Oklahoma **Norman, OK**
M.S. | Electrical and Computer Engineering | College of Engineering *Aug 2017 - May 2019*
- GRE: 320 | GPA: 4.0/4.0
- Main courses: Computer Architecture, Artificial Neural Networks, Computer Vision, Advanced Database Management

Changchun University of Science and Technology **Changchun, China**
B.E. | Electrical and Computer Engineering | College of Electrical Engineering *Sep 2013 - Jun 2017*
- GPA: 80.3/100
- Main courses: DSP, DIP, Logics Circuit, Communication Theory, Wireless Communicate Technology, Field and Wave Electromagnetics

Skills

- **Machine Learning:** Python, Java, MATLAB, PyTorch, TensorFlow, CNN, RNN, LSTM, GAN, DRL
- **Software Engineering:** Linux, HTML, CSS, IntelliJ IDEA, Spring, CORE, MySQL, PostgreSQL, MongoDB, Pig, R, Rstudio, VHDL