Haopeng Wang

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Summary

Ph.D. in Electrical and Computer Engineering with extensive work and research project experience in AI, Multimedia, Metaverse, and Healthcare. Proven track record of leading projects from conception to completion by proposing advanced algorithms to create innovative solutions to complex problems. Recognized for academic excellence and significant contributions to the field, evidenced by multiple peer-reviewed publications. Currently a postdoctoral researcher, eager to apply my expertise and passion in a challenging and impactful role.

Work Experience

Postdoctoral Researcher *(University of Ottawa)* **Ottawa, ON** *03/2024 - present*

- Conduct advanced research in Multimedia, Metaverse, AI, and Healthcare.
- Lead a team working on optimization of wireless access point placement.
- Supervise Master and PhD students on various research topics.

Research Assistant *(University of Ottawa)* **Ottawa, ON** *09/2018 - 03/2024*

- Conducted advanced research in Multimedia, Metaverse, AI, and Healthcare.
- Completed various projects and published peer-reviewed publications in top-tier journals.

Teaching Assistant *(University of Ottawa)* **Ottawa, ON** *01/2020 - 12/2023*

- Assisted in delivering multiple courses, including Computer Architecture I/II, and Real Time System Design.
- Led discussion sections and lab sessions, facilitating hands-on learning and reinforcing lecture materials.
- Graded assignments, exams, and quizzes for classes of 200 students, providing detailed and constructive feedback to enhance learning outcomes.

Project Experience

Optimization of Wireless Access Point Placement

- As a team leader, propose and optimize the placement of wireless access points to improve network coverage and efficiency.
- Collaborated with sponsors, regularly reporting project progress and incorporating their feedback to refine and enhance project outcomes.
- Supervise Master and PhD students on various research topics, providing guidance and support to advance their academic and research skills.

Interconnected XR Network Performance Measurement and Diagnostics

- Proposed and established an XR architecture to clarify XR requirements within the campus network.
- Developed a multimodal spatial-temporal attention transformer to prediction viewpoint trajectory, achieving a performance improvement of up to **4%**.
- Designed a dynamic programming-based packet scheduling strategy for high-quality VR video streaming, resulting in a **6.4%** enhancement in streaming quality.
- Built a multi-agent deep reinforcement learning decision system for adaptive VR video streaming, significantly improving system QoE by up to **85.5%**.

Real-time Contactless Vital Signs Estimation *Github Demo*

- Designed and conducted experiments to collect data from various participants, ensuring robust and reliable datasets for analysis.
- Proposed a deep learning method for simultaneous vital signs estimation by extracting and analyzing rPPG signals from humans.
- Achieved accurate real-time estimations with an improvement of **8.2%** using a short video sequence and integrated algorithms into an Android App.

Deep Learning-Enabled Emotion Care System *Github Demo*

- Designed and conducted comprehensive experiments to collect data from diverse participant groups for in-depth analysis.
- Designed and developed an emotion care system for autism disorder patients, leveraging OpenCV, image processing, and convolutional neural networks (CNN) to enhance emotional recognition and support.
- Achieved accurate real-time recognition with an accuracy of **95.89%**.

Education

Doctorate in Philosophy Electrical and Computer Engineering *University of Ottawa* *2020-2024*
Master of Electrical and Computer Engineering (Fast-track to PhD) *University of Ottawa* *2018-2019*
Master of Electronics and Communication Engineering *Beijing Institute of Technology* *2015-2017*
Bachelor of Information Engineering *Beijing Institute of Technology* *2011-2025*

Selected Publications

- **Haopeng Wang**, Zijian Long, Haiwei Dong, and Abdulmotaleb El Saddik. "MADRL-Based Rate Adaptation for 360° Video Streaming With Multi-Viewpoint Prediction." IEEE Internet of Things Journal (2024).
- **Haopeng Wang**, Haiwei Dong, and Abdulmotaleb El Saddik. "Tile-Weighted Rate-Distortion Optimized Packet Scheduling for 360° VR Video Streaming." IEEE Intelligent Systems (2024).
- **Haopeng Wang**, Roberto Martinez-Velazquez, Haiwei Dong, and Abdulmotaleb El Saddik. "Experimental Studies of Metaverse Streaming." IEEE Consumer Electronics Magazine (2024).
- **Haopeng Wang**, Yufan Zhou, and Abdulmotaleb El Saddik. "VitaSi: A real-time contactless vital signs estimation system." Computers and Electrical Engineering 95 (2021): 107392.
- **Haopeng Wang**, M. Shamim Hossain, and Abdulmotaleb El Saddik. "Deep learning (DL)-enabled system for emotional big data." IEEE Access 9 (2021): 116073-116082.

Skills

- **Key Skills:** Machine learning and AI, LLM, Data Science, Computer Vision, Signal Processing, Image Processing, Vital Signs (ECG/EEG, PPG), Computer Network
- **Programming Languages:** Python, JavaScript, C, C++, Assembly, SQL, Java
- **Machine Learning Frameworks:** Pytorch, Tensorflow, TensorFlow Lite, Keras, Scikit-learn, Huggingface
- **Tools:** Pycharm, Anaconda, Git, MATLAB, Google Cloud Platform, Wireshark, NS3, VS Code, Android Studio

Academic Awards & Activities

- Won the Admission Scholarship of University of Ottawa
- Won the Academic Scholarship of Beijing Institute of Technology
- Volunteer of ACM Multimedia Conference 2023 11/2023
- Volunteer of ACM International Conference on Multimedia Retrieval 2019 06/2019