CURRICULUM VITAE
Shuang Li

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Summary

I am a Research Associate and Lecturer in the Department of Electrical and Computer Engineering at the University of Victoria. My research primarily focuses on wireless communications, optimization and control in **wireless body area networks (WBANs)**. I specialize in applying **advanced machine learning (ML) and deep reinforcement learning (DRL)** to improve the reliability, energy efficiency, and real-time performance of modern WBANs. This work supports emerging applications in smart healthcare, connected sensing, and next-generation Internet of Things (IoT).

I have been recognized for my academic and research excellence through the CSC PhD Fellowship (2021-2025) and the NSERC/SFU Invention to Innovation Skills Training Grant (2025-2026). Driven by both theoretical innovation and practical implementation, I aim to advance reliable, intelligent, and sustainable wireless **cyber-physical systems (CPS)** and contribute to interdisciplinary research and engineering education in digital health and intelligent systems. My Canadian permanent residence application is currently in process.

Employment History

- **Research Associate,** University of Victoria
  Department of Electrical and Computer Engineering   2025 ~ Present
- **Lecturer,** University of Victoria
  Department of Electrical and Computer Engineering   2025 ~ Present

Education

- **Ph.D.,** University of Victoria   2020 ~ 2025
  Department of Electrical and Computer Engineering
- **M.E.,** Jilin University   2017 ~ 2020
  Department of Communication Engineering
- **B.E.,** Jilin University   2013 ~ 2017
  Department of Communication Engineering

Research Interests

- Machine Learning & Deep Reinforcement Learning
- Wireless Body Area Networks & Next-Generation IoT
- Wireless Cyber-Physical Systems & Integrated Sensing and Communication
- Optimization and Control in Real-Time Systems
- Energy-Efficient and Reliable Wireless System Design

Miscellaneous Experience

Awards and Achievements

- **i2I Innovation training Grant**, SFU&NSECR   2025/09 ~ 2026/04
- **Research Assistantship**, University of Victoria   2020/09 ~ Present
- **PhD Fellowship**, China Scholarship Council (CSC)   2021/05 ~ 2025/05
- **First Class Scholarship**, Jilin University   2019/10
- **Outstanding Student Leader**, Jilin University   2019/10
- **Outstanding Graduate Student Scholarship**, Jilin University   2017/12

Research Publications

Journal Articles

[1] **S. Li**, H. Yu, H. -C. Yang, K. Xiong, P. Fan and K. B. Letaief, "AoI Minimization for WP-IoT with PDQN-based Hybrid Offline/Online Learning: A Joint Scheduling and Transmission Design Approach," *IEEE Trans. Cognit. Commun. Networking*, vol. 12, pp. 4547-4560, 2026.

[2] **S. Li**, H. -C. Yang and F. Hu, "Joint Transmission Mode Selection and Scheduling for AoI Minimization in NOMA-Capable WP-IoT Networks: A Deep Transfer Learning Solution," *IEEE Trans. Commun.*, vol. 73, no. 8, pp. 5805-5816, Aug. 2025.

[3] **S. Li**, H. -C. Yang, F. Xu, H. Hu and F. Hu, "Energy-Efficient Relay Transmission for WBAN: Energy Consumption Minimizing Design with Hybrid Supervised/Reinforcement Learning," *IEEE Internet Things J.*, vol. 11, no. 10, pp. 17770-17779, May 15, 2024.

[4] **S. Li**, F. Hu, Z. Xu, Z. Mao, Z. Ling and H. Liu, "Joint Power Allocation in Classified WBANs With Wireless Information and Power Transfer," *IEEE Internet Things J.*, vol. 8, no. 2, pp. 989-1000, Jan.15, 2021.

[5] **S. Li**, F. Hu, Z. Mao, Z. Ling and Y. Zou, "Sum-Throughput Maximization by Power Allocation in WBAN With Relay Cooperation," *IEEE Access*, vol. 7, pp. 124727-124736, 2019.

Conference Proceedings

[1] **S. Li**, H. Yu and H. -C. Yang, "Towards Energy-Efficient and Freshness-Sensitive WBANs Through Joint Scheduling and Power Control via Multi-Objective Reinforcement Learning", IEEE *WCNC2026*, Accepted, Kuala Lumpur, Malaysia, April 2026.

[2] **S. Li**, H. Yu and H. -C. Yang, "Multi-Objective Optimization for Energy-Efficient and Reliable Transmission in WBANs: Session-Specific Design Using MODRL," IEEE *VTC2025-Spring*, Oslo, Norway, 2025, pp. 1-5.

[3] **S. Li**, F. Xu and H. -C. Yang, "Reliable and Energy-Efficient Relay Transmission in WBANs with Wireless Power Transfer: Optimal Design with DRL," *IEEE PACRIM*, Victoria, BC, Canada, 2024, pp. 1-6.

[4] **S. Li**, H. -C. Yang and F. Hu, "Average AoI Minimization in WP-IoT Networks: Optimal Scheduling for NOMA Transmission," *IEEE/CIC ICCC*, Dalian, China, 2023, pp. 1-6.

[5] **S. Li**, F. Hu, Z. Mao, H. Liu and Z. Ling, "Joint Power Allocation for Energy Harvesting to Maximize Throughput in Classified WBAN," *IEEE GLOBECOM*, Waikoloa, HI, USA, 2019, pp. 1-6.

[6] **S. Li**, F. Hu, J. Yu and Z. Huang, "Optimal Power Allocation with a Cooperative Relay in Multi-point WBAN," *IEEE/CIC ICCC*, Changchun, China, 2019, pp. 919-924.

Presentations and Seminars

Presentations

- S. Li, F. Xu and H. -C. Yang, "*Reliable and Energy-Efficient Relay Transmission in WBANs with Wireless Power Transfer: Optimal Design with DRL*," Victoria, BC, Canada, Aug. 2024. (Invited oral presentation on conference paper)
- S. Li, H. -C. Yang and F. Hu, "*Average AoI Minimization in WP-IoT Networks: Optimal Scheduling for NOMA Transmission*," Dalian, China, Aug. 2023. (Invited oral presentation on conference paper)
- S. Li, F. Hu, Z. Mao, H. Liu and Z. Ling, "*Joint Power Allocation for Energy Harvesting to Maximize Throughput in Classified WBAN*," Waikoloa, HI, USA, Dec. 2019. (Poster presentation)
- S. Li, F. Hu, J. Yu and Z. Huang, "*Optimal Power Allocation with a Cooperative Relay in Multi-point WBAN*," Changchun, China, Aug. 2019. (Invited oral presentation on conference paper)

Seminar

- S. Li, "Joint Transmission Mode Selection and Scheduling for AoI Minimization in NOMA-Capable IoT Networks", University of Victoria, BC, Canada, Apr. 2025. (ECE Research Day)
- S. Li, "Multi-Objective Optimization for Energy-Efficient and Reliable Transmission in WBANs", University of Victoria, BC, Canada, July 2025. (Graduate Student Seminar)

Teaching Experience

- **Instructor**, University of Victoria   Spring 2026 ~ Fall 2025
  Course: ECE 403/503: Optimization for Machine Learning
  - Designed and delivered lectures on various optimization for machine learning.
  - Developed problem sets, lab exercises, and the midterm exam, final exam.
  - Created grading rubrics and coordinated marking with teaching assistants.
  - Held weekly office hours and student consultations and managed the course website and communications.
  - Supervised and mentored graduate-level course projects.

- **Teaching Assistant,** University of Victoria (During PhD)   2022 ~ 2024
  Course: ECE 496A/519A: 5G Wireless and IoT
  - Supported to labs and coursework on network protocols, IoT architectures, and communication system engineering.

  Course: ECE 310: Digital Signal Processing I
  - Graded assignments and provided support.

Research Experience

- **Research Associate**, University of Victoria, YWAILab
  Advisor: Prof. Hong-Chuan Yang
  Project: AI-Empowered WBANs: Hardware Implement
- Leading the transition from algorithm development to FPGA/RFSoC hardware implementation, enabling real-time embedded processing of ML-driven scheduling and control strategies.
- Delivering empirical validation of intelligent wireless systems to bridge the gap between simulation models and deployable systems.

- **Research Assistant**, University of Victoria, YWAILab
  Advisor: Prof. Hong-Chuan Yang
  Project: Energy Efficiency Transmission in WBANs: Optimal Design using DRL
  - Designed energy-efficient transmission protocols for low-power IoT and WBAN devices
  - Developed hybrid supervised/DRL solutions for energy consumption minimization
  - Analyzed the effect of slot duration on energy consumption and develop a guideline for practical WBAN design

  Project: Freshness-Sensitive IoT Networks: Optimal Scheduling Scheme using DRL
  - Developed intelligent scheduling agents with real-time decision-making capabilities
  - Proposed a parameterized deep Q-network (PDQN) solution for joint scheduling and blocklength selection to minimize Age of Information (AoI)
  - Develop a deep transfer learning (DTL) solution to accelerate learning and learn the optimal scheduling policy for AoI minimization

  Project: Multi-Objective Optimization (MOO) in IoT Networks: Trade-off with Multi-Objective Reinforcement Learning (MORL)
  - Investigated MORL to optimize trade-offs relevant to performance, energy, and system reliability in IoT networks
  - Developed preference-guided MORL algorithms to achieve flexible trade-offs among conflicting objectives

Professional Service

- **Technical Program Committee Member:**
  IEEE GLOBECOM 2025/2026
  IEEE PACRIM 2024
  IEEE/CIC ICCC 2019

- **Reviewer:**
  IEEE WCNC 2025
  IEEE Internet of Things Journal (IoT)
  IEEE Transactions on Vehicular Technology (TVT)
  IEEE Transactions on Cognitive Communications and Networking (TCCN)

- **Student Volunteer:**
  2024 IEEE Pacific Rim Conference on Communications, Computers and Signal Processing (PACRIM)
  2019 IEEE/CIC International Conference on Communications in China (ICCC)

Mentorship Experience

Graduate Mentor. Department of Electrical and Computer Engineering, University of Victoria
Supervised and mentored M.Eng. students in Professor Hong-Chuan Yang's group:

- **Thet Naung San** (Fall 2024): Guided a master's project, reviewed and improved code implementations, and assisted in troubleshooting technical issues throughout the project.

Collaborators

Dr. Hong-Chuan Yang, University of Victoria, Canada

Dr. Xiaodai Dong, University of Victoria, Canada

Dr. Lin Cai, University of Victoria, Canada

Dr. Yang Shi, University of Victoria, Canada

Dr. Xiaochan Xue, University of Hawaii at Manoa, USA

Dr. Xiaolan Liu, University of Bristol, UK

Dr. Fengye Hu, Jilin University, China

Skills

- **Programming & Tools**: Python, MATLAB, C/C++, Java
- **Wireless & CPS:** WBAN/IoT protocol design, signal processing, optimization, real-time systems
- **ML/AI:** DRL (DQN, PDQN, Actor–Critic), supervised learning, transfer learning
- **Software & Web:** HTML, JavaScript, LaTeX
- **Languages:** English, Mandarin Chinese

Relevant Coursework

- **Machine Leaning & Computing**: Optimization for Machine Learning; Deep Reinforcement Learning; Computing Principles for Embedded Systems; Computing Principles for Mobile and Embedded Systems; Computer Architecture; Python; C++

- **Wireless & IoT**: Wireless Communications; Communication Theory; Computer Network; IoT Advanced Engineering Design; Information & Coding Theory

- **Mathematics & Theory**: Advanced Mathematics; Probability Theory & Statistics; Complex Analysis & Integral Transformation; Analytical Methods in Electrical Engineering; Random Signal Analysis

- **Circuits & Signal Processing**: Digital Signal Processing; Signals & Systems; Data Acquisition; Digital Circuit & Logic Design; Analog Electronic Circuits; High-Speed Circuit Signal Integrity Analysis & Design.

- **Control**: Introduction to Control Theory