Shiwei Huang

47-2090 Pembina HWY, Winnipeg, Manitoba, Canada R3T 2G8 • huangs37@myumanitoba.ca • +1 (204) 898-8369
Google Scholar: https://scholar.google.ca/citations • LinkedIn: https://www.linkedin.com/in/shiwei-huang-6400b3148/

SUMMARY

Objective: New PhD Grad looking for a full-time machine learning developer intern position
Skills: Java, Python, Numpy, Pandas, Matplotlib, Scikit-learn, Keras, Pytorch, Matlab
Knowledge: Optimization, Machine Learning, Deep Learning, MDP, Q-learning,
Language: English, Mandarin

EDUCATION

PhD from University of Manitoba, Winnipeg, Canada — Sep 2013 – May 2018
- Field: Electrical and Computer Engineering
- GPA: 4.5 / 4.5
- Thesis: Optimization-Based Resource Allocation and Transmission Scheduling for Wireless Networks

MSc from Guilin University of Electronic Technology, Guilin, China
- Field: Telecommunication and Information Systems — Sep 2010 – Jun 2012
- GPA: 89.9 / 100
- Thesis: Study on Optimization Problems for Cooperative Spectrum Sensing in Cognitive Networks

SKILLS

Deep understanding of **Markov decision processes and Q-learning**
- Developed an advanced Q-learning algorithm with reduced storage space under the post-decision state framework for Markov decision processes with environment-dependent cost functions

Strong knowledge of **machine learning and deep learning**
- Took a series of online courses from world-renowned institutions to gain knowledge of machine learning and deep learning, covering support vector machines, logistic regression, convolutional neural networks, recurrent neural networks, autoencoders, etc.
- Practiced applying artificial neural networks for customer churn analysis, convolutional neural networks for image classification, restricted Boltzman machines and autoencoders for recommendation systems

Deep understanding of **convex optimization, linear programming** and their applications
- Finished many academic projects related to optimization techniques

Strong ability of **scientific paper writing**
- Authored and co-authored about 16 research papers in peer-reviewed journals and conference proceedings

EXPERIENCE

Research Assistant with University of Manitoba — Sep 2013 – May 2018
- Developed a new learning algorithm with reduced storage space under the post-decision state framework for Markov decision processes with environment-dependent cost functions, which was used to improve the throughput and delay performance of buffer-aided relay networks
- Developed an analytical framework for buffer-aided decode-and-forward relay networks under time-correlated fading channels, based on the theory of quasi-birth-death Markov chains
- Designed a joint optimization scheme of admission control, link scheduling, and resource management for D2D-assisted mobile edge computing, according to the branch-and-price optimization method. Compared to the traditional non-D2D scheme, the number of admitted users increases by about 200%
- Designed an interference-avoidance scheduling scheme for dense multi-user coexisting networks with heterogeneous priorities and demands, on the basis of the column generation optimization method. Compared to the traditional coloring algorithm, the number of admitted users increased by about 35%
- Proposed a transmit power optimization algorithm for amplify-and-forward relay networks based on the two-stage stochastic programming method, where energy consumption kept almost the same as the traditional power control scheme while the control signaling overhead reduced by about 50%

Teaching Assistant with University of Manitoba — Sep 2014 – Sep 2017
- Taught laboratory courses and marked assignments for *Wireless Networks* and *Communication Systems*

Research Assistant with Guilin University of Electronic Technology — Sep 2010 – Jun 2012
- Designed a cooperative spectrum sensing scheme to enhance the accuracy in detecting the presence of primary users

SELECTED PUBLICATIONS

JOURNALS

[1] **Shiwei Huang**, Jun Cai, and Changyan Yi, "Joint Admission Control and Resource Management for D2D-Assisted Mobile Edge Computing," submitted to *IEEE Transactions on Mobile Computing*.

[2] **Shiwei Huang**, Jun Cai, Hongbin Chen, and Feng Zhao, "Low-complexity Priority-aware Interference-avoidance Scheduling for Multi-user Coexisting Wireless Networks," *IEEE Transactions on Wireless Communications*, vol. 17, no. 1, pp. 112–126, Jan. 2018.

[3] **Shiwei Huang** and Jun Cai, "An Analysis Framework for Buffer-Aided Relaying Under Time-Correlated Fading Channels," *IEEE Transactions on Vehicular Technology*, vol. 65, no. 9, pp. 6987–6999, Sept. 2016.

[4] **Shiwei Huang**, Jun Cai, Hongbin Chen and Hong Zhang, "Transmit Power Optimization for Amplify-and-Forward Relay Networks With Reduced Overheads," *IEEE Transactions on Vehicular Technology*, vol. 65, no. 7, pp. 5033–5044, Jul. 2016.

[5] **Shiwei Huang**, Hongbin Chen, Jun Cai, and Feng Zhao, "Energy Efficiency and Spectral-Efficiency Tradeoff in Amplify-and-Forward Relay Networks," *IEEE Transactions on Vehicular Technology*, vol. 62, no. 9, pp. 4366–4378, Nov. 2013.

[6] Zhen Zhao, **Shiwei Huang**, and Jun Cai, "An Analytical Framework for IEEE 802.15.6-Based Wireless Body Area Networks with Instantaneous Delay Constraints and Shadowing Interruptions," accepted for publication in *IEEE Transactions on Vehicular Technology*.

[7] Changyan Yi, **Shiwei Huang**, and Jun Cai "An Incentive Mechanism Integrating Joint Power, Channel and Link Management for Social-Aware D2D Content Sharing and Proactive Caching," accepted for publication in *IEEE Transactions on Mobile Computing*.

[8] Huijin Cao, Hongqiao Tian, Jun Cai, Attahiru S. Alfa and **Shiwei Huang**, "Dynamic Load-balancing Spectrum Decision for Heterogeneous Services Provisioning in Mutil-channel Cognitive Radio Networks," *IEEE Transactions on Wireless Communications*, vol. 16, no. 9, pp. 5911–5924, Sep. 2017.

[9] Hong Zhang, Jun Cai, Xiaolong Li and **Shiwei Huang**, "Adaptive Service Rate and Vacation Length for Energy-Efficient HeNB Based on Queueing Analysis," *IEEE Transactions on Vehicular Technology*, vol. 65, no. 10, pp. 8696–8709, Oct. 2016.

[10] **Shiwei Huang**, Hongbin Chen, Yan Zhang, and Hsiao-Hwa Chen, "Sensing-Energy Tradeoff in Cognitive Radio Networks with Relays," *IEEE Systems Journal*, vol. 7, no. 1, pp. 68-76, Mar. 2013.

[11] **Shiwei Huang**, Hongbin Chen, Yan Zhang, and Feng Zhao, "Energy-Efficient Cooperative Spectrum Sensing with Amplify-and-Forward Relaying," *IEEE Communications Letters*, vol. 16, no. 4, pp. 450-453, Apr. 2012.

[12] **Shiwei Huang**, Hongbin Chen, and Yan Zhang. "Optimal Power Allocation for Spectrum Sensing and Data Transmission in Cognitive Relay Networks," *IEEE Wireless Communications Letters*, vol. 1, no. 1, pp. 26-29, Feb. 2012.

CONFERENCES

[1] Zhen Zhao, **Shiwei Huang**, and Jun Cai, "Energy Efficient Packet Transmission Strategies for Wireless Body Area Networks with Rechargeable Sensors **(Invited Paper)**," accepted to be published in *Proc. of IEEE Vehicular Technology Conference (VTC) 2017-Fall*, Toronto, Canada, Sep. 2017.

[2] **Shiwei Huang**, Changyan Yi, and Jun Cai, "A Sequential Posted Price Mechanism for D2D Content Sharing Communications," in *proc. of IEEE Global Communications Conference (GLOBECOM)*, Washington DC, Dec. 2016, pp. 1–6.

[3] **Shiwei Huang**, Jun Cai and Hong Zhang, "Relay Selection for Average Throughput Maximization in Buffer-Aided Relay Networks," in *proc. of IEEE International Conference on Communications (ICC)*, London, UK, Jun. 2015, pp. 1994–1998.

[4] **Shiwei Huang** and Jun Cai, "Priority-Aware Scheduling for Coexisting Wireless Body Area Networks **(Invited Paper)**," in *proc. of International Conference on Wireless Communications and Signal Processing (WCSP)*, Nanjing, China, Oct. 2015, pp. 1–5.