Shaswot Shresthamali

CONTACT INFORMATION

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EDUCATION

Ph.D., Information Science and Technology, **March 2021**
The University of Tokyo, Japan

Dissertation Advisor: Prof. Hiroshi Nakamura

Dissertation Title: *Reinforcement Learning-Based Optimization in Energy Harvesting Wireless Sensor Nodes*

Master of Information Science and Technology, **March 2018**
The University of Tokyo, Japan

Dissertation Advisors: Prof. Hiroshi Nakamura, Prof. Masaaki Kondo

Dissertation Title: *Adaptive Power Management of Solar Energy Harvesting Sensor Node by Reinforcement Learning*

Bachelor of Engineering, Electronics and Communication Engineering, **October 2012**
Tribhuvan University, Nepal

Final Year Project Advisor: Prof. Dinesh Kumar Sharma

Final Year Project: *Digital Audio Processor*

EMPLOYMENT

Research Associate Professor, **April 2024–Present**
CPC Laboratory,
Department of Advanced Information Technology,
Kyushu University,
Japan

Project Assistant Professor, **April 2023–March 2024**
Kondo Laboratory,
Department of Information and Computer Science,
Keio University,
Japan

Researcher, **April 2021–March 2023**
Kondo Laboratory,
Department of Information and Computer Science,
Keio University,
Japan

Research Fellow, **April 2018–March 2021**
Japan Society for the Promotion of Science (JSPS),
Tokyo, Japan

Engineer, **February 2018–August 2018**
Ridge-i, Tokyo, Japan

Assistant Professor, **November 2012–October 2014**
Sagarmatha Engineering College,
Tribhuvan University, Nepal

Research Interests

I currently conduct research in the fields of **quantum computing** and **artificial intelligence**. In quantum computing, I focus on developing quantum systems based on superconducting qubits as a member in the **Fault Tolerant Superconducting Quantum Computer System Design** team of the Moonshot Research and Development Program Goal 6. In artificial intelligence, my work explores **architectural optimizations** for reinforcement learning.

My doctoral research deals with RL-based methods for energy scheduling in energy-harvesting wireless sensor nodes. The focus is on applied RL and its relation to **multi-objective RL**, **off-policy learning** and **distributed learning**.

Grants

Grant-in-Aid for Early-Career Scientists, JSPS **2024–2027**
Transformer-based Framework for Multi-objective Reinforcement Learning using Hierarchical Policies
Principal Investigator: Shaswot Shresthamali
Budget Amount: ¥4,680,000

Grant-in-Aid for JSPS Fellows, JSPS **2018–2021**
Adaptive Power Management of IoT Systems by Reinforcement Learning
Principal Investigator: Shaswot Shresthamali
Budget Amount: ¥2,200,000

Honors and Awards

Young Researcher Award, Information Processing Society of Japan (IPSJ) **2022**

DC1 Fellowship, JSPS **2018–2021**

Young Researcher Award, Information Processing Society of Japan (IPSJ) **2016**

Japanese Government MEXT Scholarship, **2015-2018**

College Fellowship, Pulchowk Campus, Tribhuvan University **2008–2012**

Teaching Experience

Assistant Professor, Sagarmatha Engineering College, Tribhuvan University

Digital Signal Processing	**Winter 2013**
Advanced Electronics	**Winter 2012, 2013**
Instrumentation II	**Winter 2013**
Embedded Systems	**Winter 2013**
Electronic Devices and Circuits	**Winter 2013**
Electric Circuit Theory	**Summer 2013**
Basic Electronics Engineering	**Summer 2013**

Mentoring/ Supervision

Graduate Students

Yikai Mao (Doctoral student)	**April 2022–Present**
Thet Htar Su (Doctoral student)	**April 2023–Present**
Davide Laureti (Master student)	**November 2023–April 2024**
Jules Feron (Master student)	**November 2023–April 2024**
Maelle Gabens (Master student)	**November 2023–April 2024**
Sugimoto Hirotada (Bachelor student)	**November 2022–April 2024**
Lorenzo Sonnino (Master student)	**November 2021–October 2023**

Professional Activities, Outreach, and Service

Invited Speaker

16th IOE Graduate Conference (IOEGC) **April 18-20, 2025**
Keynote: "The Power and the Price of Intelligence: Rethinking Computation in the Age of AI"

2nd International Conference at St. Xavier's College (ICSXC) **November 14-15, 2024**
Keynote: "The (Energy) Cost of Artificial Intelligence"

Annual Nepal AI School (NAAMI) **December 20, 2021**
"Learning to Learn Linear Algebra"

Nepal Engineers Association Japan (NEAJ) **November 27, 2021**
"Reinforcement Learning for Energy Harvesting Wireless Sensor Nodes"

Nepal-Japan Educational Dialogue **November 26, 2021**
Webinar: "Higher Education Opportunities in Japan"

Sustainable Computing Systems Workshop 2021 (SUSCW) **November 24, 2021**
Keynote: "Reinforcement Learning for Energy Harvesting Wireless Sensor Nodes"

The University of Tokyo Alumni Association Nepal (UTAAN) (2021 Benkyokai) **April 17, 2021**
"Reinforcement Learning for Energy Harvesting Wireless Sensor Nodes"

Program Committee

27th European Conference on Artificial Intelligence (ECAI 2024) **October 2024**

3rd Workshop on Machine Learning on Edge in Sensor Systems (SenSys-ML 2024) **May 2024**

2024 IEEE 17th International Symposium on Embedded Multicore/Many-core Systems-on-Chip (MCSoC 2024) **December 2024**

2023 IEEE 16th International Symposium on Embedded Multicore/Many-core Systems-on-Chip (MCSoC 2023) **December 2023**

6th Sustainable Computing Systems Workshop (SUSCW 23) **November 2023**

5th Sustainable Computing Systems Workshop (SUSCW 22) **November 2022**

4th Sustainable Computing Systems Workshop (SUSCW 21) **November 2021**

Workshop on Challenges in Artificial Intelligence and Machine Learning for Internet of Things (AIChallengeIoT 2020) **November 2020**

The University of Tokyo Nepali Society (UTNeS) **2015–2021**
President (2017–2018)

Seminar Organizer

A Seminar on FPGA Technology and its role in Electronics Engineering in Nepal
Sagarmatha Engineering College, Nepal **July 2013**

Refereed Publications

1. Wu, M., **Shresthamali, S.**, Lui, X., He, Y., (2025)
EATS: Energy-Aware Adaptive Topology Switching for NoCs,
Great Lakes Symposium on VLSI 2025 (GLSVLSI '25)
2. Su, T.H., **Shresthamali, S.**, Kondo, M., (2025)
Quantum framework for Reinforcement Learning: integrating Markov Decision Process, quantum arithmetic, and trajectory search,
Physical Review A

3. Mao, Y., **Shresthamali, S.**, Kondo, M., (2025)
Q-Gen: A Parameterized Quantum Circuit Generator,
IEEE Transactions on Quantum Engineering (Volume: 6)
4. Mao, Y., **Shresthamali, S.**, Kondo, M., (2025)
Q-fid: Quantum Circuit Fidelity Improvement with LSTM Networks,
Advanced Quantum Technologies 2025
5. Sonnino, L., **Shresthamali, S.**, He, Y., Kondo, M., (2024)
DAISM: Digital Approximate In-SRAM Multiplier-based Accelerator for DNN Training and Inference,
2024 Design, Automation and Test in Europe Conference (DATE 2024)
6. **Shresthamali, S.**, Kondo, M., (2023)
Enhancing Deep Reinforcement Learning with Compressed Sensing-based State Estimation,
2023 IEEE 16th International Symposium on Embedded Multicore/Many-core Systems-on-Chip (MCSoC) (pp. 371-378).
7. **Shresthamali, S.**, He, Y., Kondo, M., (2022)
FAWS: Fault-Aware Weight Scheduler for DNN Computations in Heterogeneous and Faulty Hardware,
2022 IEEE International Conference on Parallel and Distributed Processing with Applications (ISPA) (pp. 204-212).
8. **Shresthamali, S.**, Kondo, M., Nakamura, H., (2022)
Multi-Objective Resource Scheduling for IoT Systems using Reinforcement Learning,
Journal of Low Power Electronics and Applications 12.4 (2022): 53.
9. **Shresthamali, S.**, Kondo, M., Nakamura, H., (2021)
Multi-objective Reinforcement Learning for Energy Harvesting Wireless Sensor Nodes,
2021 IEEE 14th International Symposium on Embedded Multicore/Many-core Systems-on-Chip (MCSoC) (pp. 98-105).
10. **Shresthamali, S.**, Kondo, M., Nakamura, H., (2019)
Power Management of Wireless Sensor Nodes with Coordinated Distributed Reinforcement Learning,
2019 IEEE 37th International Conference on Computer Design (ICCD) (pp. 638-647).
11. **Shresthamali, S.**, Kondo, M., Nakamura, H., (2017)
Adaptive power management in solar energy harvesting sensor node using reinforcement learning,
ACM Transactions on Embedded Computing Systems (TECS), Vol. 16, Issue 5s, pp 1-21, September, 2017.
12. Chhetri, S., R., Poudel, B., Ghimire, S., **Shresthamali, S.**, Sharma, D., K., (2015)
Implementation of Audio Effect Generator in FPGA,
Nepal Journal of Science and Technology 2014, Vol. 15, Issue 1, pp. 89-98, December, 2014.
13. **Shresthamali, S.**, (2014)
Parallel Processing Using FPGAs,
KEC Journal of Science and Engineering (KJSE), Vol. 2, Issue 1, pp 79-82, November, 2014.

Unrefereed Publications

1. **Shresthamali, S.**, Kondo, M., (2022)
Enhancing Deep Reinforcement Learning with Compressed Sensing-based State Estimation,
Summer Workshop on Parallel/Distributed/Cooperative Processing (SWoPP 2023)
2. 杉本　寛直, シュレスタマリ サソット, 近藤 正章 (2023)
局所グラフ情報を用いた強化学習による*AGV*の経路スケジューリング手法の検討 *(A study of reinforcement learning-based AGV route scheduling using local graph information)*,
第244回システム・アーキテクチャ研究発表会（ETNET2023），
3. **Shresthamali, S.**, He, Y., Kondo, M., (2022)
Fault-aware Hardware Scheduling of Computations in Deep Neural Networks ,
Summer Workshop on Parallel/Distributed/Cooperative Processing (SWoPP 2022)

4. ソニー ノ ロレンツォ, **シュレスタマリ サソット**, 和 遠, 近藤 正章 (2022)
*DNN*推論高速化のための*SRAM*ベース近似デジタル乗算器の提案,
2022年並列／分散／協調処理に関するサマー・ワークショップ (SWoPP2022),
5. **シュレスタマリ サソット**, 近藤 正章 , 中村 宏 (2017)
適応的電力制御を行う環境発電駆動センサノードの強化学習戦略の比較評価,
研究報告システム・アーキテクチャ（ARC）, Vol. 2017-ARC-227, No. 28, pp. 1-8, July, 2017.
6. **シュレスタマリ サソット**, 近藤 正章 , 中村 宏 (2017)
強化学習を用いた環境発電駆動センサノードの適応的電力制御手法の検討,
研究報告システム・アーキテクチャ（ARC）, Vol. 2017-ARC-225, No. 26, pp. 1-6, March, 2017.

Presentations

1. **EATS: Energy-Aware Adaptive Topology Switching for NoCs**,
Great Lakes Symposium on VLSI 2025 (GLSVLSI 2025), June 2025.
2. **Enhancing Deep Reinforcement Learning with Compressed Sensing-based State Estimation**,
2023 IEEE 16th International Symposium on Embedded Multicore/Many-core Systems-on-Chip (MCSoC 2023), December 2023.
3. **Enhancing Deep Reinforcement Learning with Compressed Sensing-based State Estimation** ,
Summer Workshop on Parallel/Distributed/Cooperative Processing (SWoPP 2023), August 2023
4. **FAWS: Fault-Aware Weight Scheduler for DNN Computations in Heterogeneous and Faulty Hardware** ,
2022 IEEE International Conference on Parallel and Distributed Processing with Applications (ISPA 2022), December 2022
5. **Fault-aware Hardware Scheduling of Computations in Deep Neural Networks** ,
Summer Workshop on Parallel/Distributed/Cooperative Processing (SWoPP 2022), July 2022
6. **Multi-objective Reinforcement Learning for Energy Harvesting Wireless Sensor Nodes**,
2021 IEEE 14th International Symposium on Embedded Multicore/Many-core Systems-on-Chip (MCSoC 2021), December 2021
7. **Power Management of Wireless Sensor Nodes with Coordinated Distributed Reinforcement Learning**,
2019 IEEE 37th International Conference on Computer Design (ICCD 2019), November 2019
8. **Adaptive power management in solar energy harvesting sensor node using reinforcement learning**,
2017 International Conference on Embedded Software (EMSOFT), October 2017
9. **Adaptive Power Management of Energy Harvesting Sensor Nodes using Reinforcement Learning: A comparison of Q-Learning and SARSA Algorithms**,
Summer Workshop on Parallel/Distributed/Cooperative Processing (SWoPP 2017), July 2017
10. **Reinforcement Learning For Power Management In Energy Harvesting Sensor Nodes** (Poster),
54th Design Automation Conference (DAC 2017), June 2017
11. **Adaptive Power Management For Energy Harvesting Sensor Nodes**,
217th IPSJ (ETNET 2017), March 2017
12. **FPGA: A Brief Introduction**,
Seminar on FPGA Technology And Its Role In Electronics Engineering In Nepal, Sagarmatha Engineering College, July 2013
13. **An Introduction to Parallel Processing Using FPGAs**,
LOCUS, Pulchowk Campus, June 2013