

Shaswot Shresthamali

CONTACT INFORMATION	Room 755 Kyushu University West 2nd Building, 744 Motoooka, Nishi-ku, Fukuoka 819-0395, JAPAN	shaswot.shresthamali@cpc.ait.kyushu-u.ac.jp shaswot.com +81-092-802-3668
EDUCATION	Ph.D., Information Science and Technology, The University of Tokyo, Japan Dissertation Advisor: Prof. Hiroshi Nakamura Dissertation Title: <i>Reinforcement Learning-Based Optimization in Energy Harvesting Wireless Sensor Nodes</i>	March 2021
	Master of Information Science and Technology, The University of Tokyo, Japan Dissertation Advisors: Prof. Hiroshi Nakamura, Prof. Masaaki Kondo Dissertation Title: <i>Adaptive Power Management of Solar Energy Harvesting Sensor Node by Reinforcement Learning</i>	March 2018
	B.E., Electronics and Communication Engineering, Tribhuvan University, Nepal Final Year Project Advisor: Prof. Dinesh Kumar Sharma Final Year Project: <i>Digital Audio Processor</i>	October 2012
EMPLOYMENT	Research Associate Professor, CPC Laboratory, Department of Advanced Information Technology, Kyushu University, Japan	April 2024–Present
	Project Assistant Professor, Kondo Laboratory, Department of Information and Computer Science, Keio University, Japan	April 2023–March 2024
	Researcher, Kondo Laboratory, Department of Information and Computer Science, Keio University, Japan	April 2021–March 2023
	Research Fellow, Japan Society for the Promotion of Science (JSPS), Tokyo, Japan	April 2018–March 2021
	Engineer, Ridge-i, Tokyo, Japan	February 2018–August 2018
	Assistant Professor, Sagarmatha Engineering College, Tribhuvan University, Nepal	November 2012–October 2014

RESEARCH
INTERESTS

Reinforcement Learning (RL), Deep RL, Off-policy RL, Distributed RL, Quantum Computation, Deep Learning Accelerators.

I am currently researching on novel techniques and architectures to accelerate Deep Neural Networks (DNN). I am also researching on integration of High Performance Computing (HPC) systems with Quantum Computers (QC) as a member in the QC-HPC Group of the [SQAI](#) project.

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 **neural network function approximation, off-policy learning and distributed learning**.

HONORS AND
AWARDS

Grant-in-Aid for Early-Career Scientists, JSPS	2024–2027
Young Researcher Award, Information Processing Society of Japan (IPSJ)	2022
DC1 Fellowship, JSPS	2018–2021
Grants-in-Aid for Scientific Research, 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–Present
Jules Feron (Master student)	November 2023–Present
Maelle Gabens (Master student)	November 2023–Present
Sugimoto Hirotada (Bachelor student)	November 2022–Present
Lorenzo Sonnino (Master student)	November 2021–October 2023

Interns

Chander Shekhar	July 2019
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PROFESSIONAL
ACTIVITIES,
OUTREACH, AND
SERVICE**Invited Speaker**

- Annual Nepal AI School** (NAAMI) **December 20, 2021**
“Learning to Learn Linear Algebra”
- Nepal Engineers Association Japan (NEAJ)** **November 27, 2021**
“Sharing Professional Experience and Academic Research Work”
- Nepal-Japan Educational Dialogue** **November 26, 2021**
Webinar: “Higher Education Opportunities in Japan”
- The University of Tokyo Alumni Association Nepal (UTAAN) **April 17, 2021**
Annual Benkyokai

Program Committee

- 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 **July 2013**
Sagarmatha Engineering College, Nepal

REFEREED
PUBLICATIONS

- Sonnino, L., **Shresthamali, S.**, He, Y., Kondo, M., (2024)
DAISM: Digital Approximate In-SRAM Multiplier-based Accelerator for DNN Training and Inference, (to be published)
2024 Design, Automation and Test in Europe Conference (DATE 2024)
- 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).
- 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).
- 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.

5. **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).
6. **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).
7. **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.
8. 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.
9. **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. **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.
2. **Enhancing Deep Reinforcement Learning with Compressed Sensing-based State Estimation** ,
Summer Workshop on Parallel/Distributed/Cooperative Processing (SWoPP 2023), August 2023

3. **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
4. **Fault-aware Hardware Scheduling of Computations in Deep Neural Networks** ,
Summer Workshop on Parallel/Distributed/Cooperative Processing (**SWoPP 2022**), July 2022
5. **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
6. **Reinforcement Learning for Energy Harvesting Wireless Sensor Nodes**,
Keynote Speech at 4th Sustainable Computing Systems Workshop (**SUSCW 21**),
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