Shaswot Shresthamali

CONTACT INFORMATION	Room 24-315 Keio University 3-14-1 Hiyoshi, Kouhoku, Yokohama, Kanagawa 223-8522, JAPAN	shaswot@acsl.ics.keio.ac.jp shaswot.com +81-4-5566-1599 ext:43291

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*

B.E., Electronics and Communication Engineering,   **October 2012**
Tribhuvan University, Nepal

> Final Year Project Advisor: Prof. Dinesh Kumar Sharma

> Final Year Project: *Digital Audio Processor*

EMPLOYMENT

Researcher,   **April 2021–Present**
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

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

I am currently researching on fault-tolerant methods for accelerating Deep Neural Networks (DNN) using RL and Genetic Algorithms (GA). I am also working on error-correction mechanisms for Quantum Computing.

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		
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**
Lorenzo Sonnino (Master's student)	**November 2021–Present**
Sugimoto Hirotada (Bachelor student)	**November 2022–Present**

Interns

Chander Shekhar	**July 2019**

PROFESSIONAL ACTIVITIES, OUTREACH, AND SERVICE

Invited Speaker

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

Program Committee

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

Publicity Chair

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

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

Seminar Organizer

A Seminar on FPGA Technology and its role in Electronics
Engineering in Nepal

Sagarmatha Engineering College, Nepal **July 2013**

REFEREED
PUBLICATIONS

1. **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 Distributed Processing with Applications, Big Data Cloud Computing, Sustainable Computing Communications, Social Computing Networking (ISPA/BDCloud/SocialCom/SustainCom)

2. **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.

3. **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).

4. **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).

5. **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.

6. 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, February, 2015.

7. **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.**, He, Y., Kondo, M., (2022)
Fault-aware Hardware Scheduling of Computations in Deep Neural Networks ,
202 Biennial Summer Workshop on Parallel/Distributed/Cooperative Processing (SWoPP 2022)

2. 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),

3. 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.

4. 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. **FAWS: Fault-Aware Weight Scheduler for DNN Computations in Heterogeneous and Faulty Hardware** ,
   2022 IEEE International Conference on Parallel Distributed Processing with Applications (ISPA 2022)

2. **Fault-aware Hardware Scheduling of Computations in Deep Neural Networks** ,
   202 Biennial Summer Workshop on Parallel/Distributed/Cooperative Processing (SWoPP 2022)

3. **Multi-objective Reinforcement Learning for Energy Harvesting Wireless Sensor Nodes**,
   2021 IEEE 14th International Symposium on Embedded Multicore/Many-core Systems-on-Chip (MCSoC).

4. **Reinforcement Learning for Energy Harvesting Wireless Sensor Nodes**,
   Keynote Speech at 4th Sustainable Computing Systems Workshop (SUSCW 21),
   December 2021

5. **Power Management of Wireless Sensor Nodes with Coordinated Distributed Reinforcement Learning**,
   2019 IEEE 37th International Conference on Computer Design (ICCD), November 2019

6. **Adaptive power management in solar energy harvesting sensor node using reinforcement learning**,
   2017 International Conference on Embedded Software (EMSOFT), October 2017

7. **Adaptive Power Management of Energy Harvesting Sensor Nodes using Reinforcement Learning: A comparison of Q-Learning and SARSA Algorithms**,
   217TH IPSJ SIGARC SWoPP, July 2017

8. **Reinforcement Learning For Power Management In Energy Harvesting Sensor Nodes** (Poster),
   54th Design Automation Conference (DAC), June 2017

9. **Adaptive Power Management For Energy Harvesting Sensor Nodes**,
   217th IPSJ SIGARC ETNET, March 2017

10. **FPGA: A Brief Introduction**,
    Seminar on FPGA Technology And Its Role In Electronics Engineering In Nepal, Sagarmatha Engineering College, July 2013

11. **An Introduction to Parallel Processing Using FPGAs**,
    LOCUS, Pulchowk Campus, June 2013