

Special Session on
**“Transforming Intelligent Network Management: The Synergy of Software-Defined
Networking and Machine Learning”**

in conjunction with

23rd International Conference on Hybrid Intelligent Systems (HIS 2023)

December 12-14, 2023

Website: <http://www.mirlabs.org/his23>

Hybrid Mode – Online & Offline

Onsite Venues: <http://mirlabs.org/his23/venue2.php>

Objectives and Scope

In the pursuit of a greener future, the amalgamation of Software-Defined Networking (SDN) and Machine Learning (ML) within Hybrid Intelligent Computing stands as a potential catalyst. SDN's centralized control and programmability provide a foundation for resource optimization, reducing energy consumption across network infrastructures and data centres. This architecture enables the seamless integration of renewable energy sources, further diminishing the carbon footprint of network operations.

Complementing SDN's capabilities, ML adds intelligence to network management by predicting traffic patterns, identifying anomalies, and optimizing routing decisions based on historical and real-time data. This predictive and adaptive approach enhances network efficiency, reducing energy waste during peak usage periods and advancing sustainability efforts. Moreover, SDN and ML jointly drive resource optimization, ensuring that computing power and energy are utilized judiciously, thus reducing waste. This collaboration also enables proactive maintenance, reducing network downtime and enhancing reliability, while the efficient deployment of edge computing minimizes data transmission distances, conserving energy. In smart city initiatives and IoT deployments, SDN and ML facilitate efficient traffic management, mitigating congestion and emissions. By dynamically adjusting traffic signals and routing based on real-time sensor data, these technologies optimize traffic flow, contributing to a greener urban environment. In sum, the convergence of SDN and ML within Hybrid Intelligent Computing represents a pivotal step towards a sustainable, eco-conscious future, aligning network management with environmental responsibility.

Subtopics

The topics include, but are not limited to:

- **Introduction to Sustainable Networking:** Setting the stage by introducing the importance of sustainability in network management and the role of technology in achieving it.
- **Software-Defined Networking (SDN):** An explanation of SDN principles, its centralized control, and programmability, highlighting how it can reduce energy consumption and carbon emissions.
- **Machine Learning in Network Management:** Discussing how ML complements SDN by analyzing data, predicting traffic patterns, and optimizing network resources for energy efficiency.

- **Renewable Energy Integration:** Exploring how SDN can facilitate the integration of renewable energy sources into network infrastructure, reducing reliance on fossil fuels.
- **Resource Optimization:** Detailing how SDN and ML collaborate to dynamically allocate resources based on demand, minimizing energy waste and enhancing sustainability.
- **Predictive Maintenance:** Highlighting the role of ML in predicting network failures and maintenance needs, allowing for proactive and energy-efficient maintenance practices.
- **Edge Computing for Energy Efficiency:** Discussing how SDN and ML can facilitate efficient edge computing deployments, reducing the energy required for data transmission over long distances.
- **Smart Traffic Management:** Exploring the application of SDN and ML in optimizing traffic flow in smart cities, reducing congestion, emissions, and energy consumption.
- **Reducing Downtime and Improving Reliability:** Discussing how proactive maintenance and optimization strategies enhance network reliability while conserving energy.
- **Measuring Environmental Impact:** Addressing the importance of measuring and assessing the environmental impact of SDN and ML-driven network management for sustainability monitoring and improvement.
- **Smart City Management:** Investigating all SDN and ML applications in various smart city implementation areas, such as smart healthcare system, smart traffic control, smart sewage system, smart damage control and smart education etc.

Paper publications

Proceedings will be published in Lecture Notes in Networks and Systems, Springer

(<https://www.springer.com/series/15179>)

- Indexed by SCOPUS, INSPEC, WTI Frankfurt eG, zbMATH, SCImago
- Papers maximum length is 10 pages
- Papers must be formatted according to Springer format (Latex/word) available at:
- <https://www.springer.com/de/authors-editors/book-authors-editors/manuscriptpreparation/5636#c3324>
- Submission Link: <http://www.mirlabs.org/his23/submission.php>

Important Dates

- Paper submission due: September 30, 2023
- Notification of paper acceptance: October 31, 2023
- Registration and Final manuscript due: November 10, 2023
- Conference Date: December 13-15, 2023

Special Session Chair(s)

- Dr. Sumit Badotra, School of Computer Science Engineering and Technology, Bennett University, Greater Noida, Uttar Pradesh
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