"Nineteenth Learning and Intelligent Optimization Conference", (LION19 2025),
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Special session 4: Learning and Intelligent Optimization for Physical Systems

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Abstract: Working with physical systems presents unique challenges compared to theoretical models or simulations. Experimentation time must be minimized to avoid costly hardware failures, and algorithms must ensure the safety of both the system and surrounding humans. While data-driven approaches, such as Machine Learning (ML), can learn complex models and improve over time, they require large amounts of data and struggle to provide formal guarantees. Conversely, traditional optimization methods offer stronger theoretical guarantees with less data but lack adaptability for improving performance over time. This special session seeks submissions on "Learning and Intelligent Optimization for Physical Systems," focusing on methods that combine ML and optimization techniques to address real-world challenges. Topics include robot learning, embedded systems, real-time applications, and human-computer interaction.