

Development of Adaptive Machine Learning Models for High-Load Information Systems

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Abstract: *This article examines the architecture and design principles of adaptive machine learning models capable of operating under high load and evolving data streams. It analyzes approaches to online learning, automated hyperparameter tuning, and model scaling in distributed computing environments. The importance of autonomous adaptation and resilience to changing environmental parameters is emphasized. The applicability of the proposed approach is supported by simulation testing and examples from industrial systems, including SCADA/IIoT and network security monitoring. Quantitative results are presented, demonstrating the advantages of adaptive models over traditional ones. The findings justify the feasibility of applying such models in real-time systems and industrial automation.*

Keywords: adaptive models, information systems, machine learning, IIoT, SCADA, AutoML

