1.1 General Context Massive computerization, insertion of new devices, increased data flow, and intermittent generation have considerably increased current electrical systems' complexity.The increasing application of switching devices, nonlinear loads, rectifiers, lighting controls, protection, and relaying equipment are also the causes of the PQ disturbances (KHOKHAR et al., 2015).The AI domain, with advanced ML and cognitive computing capabilities, are a key enabler of unforeseen efficiency capabilities in the context of smart energy grids (SERBAN; LYTRAS, 2020).The new generation of AI technology represented by Big Data, Machine Learning (ML), Deep Learning (DL), Pattern Recognition, and other methods are closely related to the simulation analysis of large-scale power grids (TANG et al., 2018).Besides deteriorating grid performance, the loss of PQ also has financial implications, resulting in extra costs related to the additional power consumed (PEREIRA et al., 1998).It uses a statistical learning algorithm that automatically learns and improves without human help (SHARMA; SHARMA; JINDAL, 2021).The integration of distributed generation and renewable energies is one of the major sources of PQ disturbances.ML is an area of AI that has emerged as part of the ongoing search for build- ing intelligent machines capable of learning.One of the essential elements for a good functioning of an electrical system is Power Quality (PQ).This increase resulted in necessary changes, such as the need for more intelligent electrical networks to adapt to this different reality.Artificial Intelligence (AI) may allow that these systems can become more robust and reliable.The use of advanced techniques of AI in power systems is becoming more and more notorious in recent years.AI represents a new era in society and global development based on information and knowledge.In recent years, PQ has become a growing concern for both energy utilities and consumers of the power grid.If these disturbances are not identified and classified, they can cause severe damage to distributionWith the recent Smart Grid (SG), the use of techniques that use this type of intelligence will be even more necessary.Therefore, a high-quality diagnosis of this grid is critical to identify and solve eventual problems.It is self-learning based on algorithms that mean the system learns from its experience.

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