

## The Intersection of Artificial Intelligence and Mathematics

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**Abstract :** Artificial Intelligence (AI) is fundamentally driven by mathematics, with many of its core algorithms rooted in mathematical principles such as linear algebra, probability theory, calculus, and optimization techniques. This paper explores the deep connection between AI and mathematics, highlighting the role of mathematical concepts in key AI techniques like machine learning, neural networks, and optimization. To demonstrate this connection, a case study involving the implementation of a neural network using Python is presented. This practical example illustrates the essential role that mathematics plays in training a model and solving real-world problems.

**Keywords :** AI, mathematics, machine learning, optimization techniques, image processing

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