

## **ABSTRACT**

The increased demand for food is accelerating plant diseases globally. Hence, a manual process of detection of plant diseases is almost impossible. Artificial intelligence (AI) can offer several solutions to farmers' problems. AI is facile to mitigate farmer's agriculture challenges. With the unpredictable changing climate, plants are often affected by several diseases where AI can play an important role. AI techniques such as Machine learning and deep Learning have been employed in literature to detect, predict, and design recommendation systems for plant diseases. Significant work has been done in this area in the last two decades, which can change farmer's lives in the coming years.

This paper presents a systematic multi-fold survey and analysis of such work focusing on recent AI techniques developed to combat plant diseases. This article discusses various challenges faced by farmers and their AI solutions. It analyzes several applications of AI in agriculture and current trends. Recent advancements in AI for plant disease detection, like Identification Model Improvement (IMI), Few Shot Learning (FSL), Generative Adversarial Networks (GANs), and Self Supervised Learning (SSL), are also discussed in this article. Several challenges while employing AI in plant disease detection are also discussed in this article.