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## **APPLICATION OF ARTIFICIAL INTELLIGENCE IN WILDLIFE DISEASE SURVEILLANCE**

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## Abstract

Artificial intelligence (AI) is any mainframe or computer system capable of performing equally or better than a human in all situations. The use of AI has been adopted by a wide range of organizations including healthcare, industry, commerce, education, tourism, animal husbandry and conservation. AI has the advantage of being a valuable tool for animal management and conservation. Currently, AI is more of a priority in animal tracking than supernatural resources because there is no human capacity and there is a limit to which human AI predators work. Many AI tools have been established to manage livestock and wildlife. AI tools make tracking animals easier. A.I. AI applications have the potential to revolutionize the prediction and diagnosis of animal diseases, thereby improving animal health by improving disease management. The main focus of the research study is to investigate the application of artificial intelligence for prediction and diagnosis of animal diseases through comprehensive literature review.

## Key words

Artificial intelligence (AI), Animals, Animal diseases, Prediction, Deep learning

## I. Introduction

Over the past few decades, people all over the world have become more interested in studying diseases in wildlife, and keeping an eye on them. An organization called the World Organization for Animal Health (OIE) is now keeping track of these diseases on a global scale.

Here's why this is important:-

1. Wild animals can carry diseases that might be harmful to humans. Some of these diseases are new, or have come back, or haven't been discovered yet.
2. If certain diseases spread in wildlife, it can lead to restrictions on trading animals that we use for things like food or other products. This can have a big impact on our economy.
3. Wild animals can sometimes pass diseases to the animals we raise for various purposes like farming. This can make it harder to get rid of the diseases, costing more money and causing conflicts.
4. Diseases can also be a big problem for animals that are already endangered. We don't always know how much of a risk they're facing.

The responsibilities for dealing with these issues usually fall on National Veterinary Services. But the part about both protecting animal health and wildlife conservation is often not given enough attention.

So, many countries want a clear and sustainable way to keep an eye on diseases in wildlife as

part of their regular health checks for animals.

The goal of this paper is to provide a practical and standardized plan for watching out for infectious diseases in wildlife. The paper will cover the basic ideas it's built on, how to go about monitoring diseases in wildlife, give an example from real-life cases, and then sum up the most important steps.

### **Role of ai(artificial intelligence) in wildlife disease surveillance:-**

Artificial Intelligence (AI) started in the 1950s with John McCarthy coining the term. It's about smart machines and programs that can think and learn, not just copying biology. Early AI had issues, but deep learning fixed them around 2000.

- The National Animal Disease Referral Expert System (NADRES) by ICAR-NIVEDI predicts, prevents, and controls animal diseases, including ones that affect humans. It uses data, field studies, and AI to do this. NADRES v2 collects outbreak data from 31 centers and uses regression models and machine learning.

AI has many uses like in business, entertainment, and healthcare. It helps understand what people like to watch and their health concerns, creating detailed profiles. It can be a big help to healthcare workers, assisting in predictions, monitoring, diagnosis, and more.

- In animal health, AI handles complex tasks like predicting diseases and understanding biological systems. It improves risk assessment and interventions. For example, a study created a machine-learning algorithm to diagnose a dog disease with high accuracy

AI also helps vets plan treatments based on an animal's history and genetics. It's useful for monitoring vital signs remotely. But there are challenges like data sharing and privacy concerns. Not all vets have easy access to AI tools yet. Studying how AI is used now is important for future improvements in healthcare.

### **II. Future scope of AI in wildlife disease surveillance:-**

Certainly, here are the key points summarizing the future scope of AI in wildlife disease surveillance:

1. Early Detection: AI can identify disease patterns in wildlife behavior and environmental data.
2. Predictive Modeling: It can forecast outbreaks based on historical data.
3. Remote Sensing and Drones: AI-powered technology can monitor wildlife habitats for signs of disease.
4. Diagnostic Support: AI helps analyze samples for accurate pathogen identification.

5. Data Integration: It aggregates and analyzes diverse data sources for comprehensive insights.
6. Real-time Monitoring: AI processes data immediately for rapid response to emerging threats.
7. Human-Wildlife Interface Analysis: It studies interactions for potential disease transmission points.
8. Zoonotic Disease Surveillance: AI can detect diseases with potential to jump to humans.
9. Vaccine Development: AI aids in creating tailored vaccines and optimizing distribution.
10. Public Awareness: It disseminates information about disease risks and prevention.
11. Policy and Management Recommendations: AI provides evidence-based guidance for decision-makers.
12. Global Collaboration: It enables real-time data sharing and international cooperation.

Remember, ethical considerations and responsible use are critical, and ongoing research and collaboration are key to success.

### **III. Conclusion:-**

Surveillance, monitoring, and surveys are essential components of disease management. Success relies on a solid legal foundation and tailored strategies. The technical approach must be well-balanced between theory and practice, with clear and sustainable goals. In today's Veterinary Science, all aspects must meet the highest standards. Managing wildlife diseases is particularly challenging due to its close ties to public health, animal production, and biodiversity conservation. The relationship between conservation efforts and disease control requires special attention. Standardized risk assessments are crucial to identify threats to endangered species, and effective mitigation strategies need further development. The ultimate goal is to put principles into action to minimize disease risks for rare species in complex ecosystems.

In addition, tracking the progression of illnesses over time is crucial for diagnosis, prognosis, and assessing treatment effectiveness. AI plays a significant role by comparing current data with previous datasets, providing valuable output. Computer-assisted analysis can detect subtle changes that are hard to diagnose early on, and it can also reduce issues caused by observer differences. Moreover, AI is expected to take on more administrative tasks in the future, such as medical reporting, registration, and identifying affected animals. The use of AI in predicting and diagnosing animal diseases has a positive impact on early

treatment.

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