

Revolutionizing Animal Husbandry: The Role of AI in Agriculture

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SUMMARY

Artificial Intelligence (AI) technology plays a significant role in intensive animal husbandry by supporting smart farming practices that increase animal health and wellbeing while also producing high economic returns. AI in animal husbandry aids in precision breeding through genetic analysis, improving livestock health and productivity. It enables predictive analytics for disease detection and monitoring, optimizing feed formulation, and enhancing overall farm management practices.

INTRODUCTION

Animal husbandry, the science of breeding, raising, and caring for livestock, has witnessed a remarkable transformation in recent years, thanks to the integration of Artificial Intelligence (AI) technologies. AI has emerged as a game-changer in optimizing various aspects of animal farming, enhancing efficiency, productivity, and animal welfare in ways never seen before.

Precision Livestock Farming

One of the groundbreaking applications of AI in animal husbandry is Precision Livestock Farming (PLF). PLF involves the use of sensors, data analytics, and AI algorithms to monitor and manage livestock health, behaviour, and production parameters. For instance, sensors embedded in barns or wearable devices on animals collect real-time data on temperature, humidity, feeding behaviour, and movement patterns. AI algorithms analyse this vast array of data to detect early signs of diseases, predict health issues, optimize feeding schedules, and even identify the best breeding practices. By doing so, farmers can intervene promptly, reducing the need for antibiotics, minimizing losses, and ensuring better animal well-being.

Health Monitoring and Disease Prediction

AI-powered systems enable continuous health monitoring of individual animals and entire herds. Machine learning algorithms analyse historical and real-time data to recognize patterns associated with various health conditions. Any deviations from normal behaviour or physiological parameters trigger alerts, enabling timely interventions. Moreover, AI facilitates disease prediction models by correlating environmental factors, genetics, and animal behaviour. This predictive capability helps farmers take pre-emptive measures, such as adjusting feed, altering living conditions, or segregating potentially infected animals, thereby curbing the spread of diseases and preventing economic losses.

Optimizing Breeding and Genetics

AI algorithms aid in optimizing breeding programs by analysing genetic data to predict desirable traits in livestock. By examining vast genomic datasets, AI can identify markers linked to specific traits such as disease resistance, milk production, or meat quality. This information assists farmers in selecting superior breeding pairs, accelerating genetic improvement, and producing more resilient and high-yielding animal breeds.

Automated Monitoring and Management

Automation is another facet where AI contributes significantly to animal husbandry. Autonomous drones equipped with AI-powered cameras can monitor large grazing areas, checking for livestock locations, health status, or potential threats. Automated feeding systems controlled by AI precisely dispense feed according to individual animal needs, minimizing waste and ensuring optimal nutrition.

Challenges and Ethical Considerations: Despite the incredible potential, AI in animal husbandry poses challenges and ethical considerations. Data privacy, algorithm biases, and the need for skilled technicians to

manage AI systems are among the concerns. Moreover, ethical dilemmas arise regarding the treatment of animals in technology-driven environments and the potential dependency of farmers on AI systems.

The Future of AI in Animal Husbandry

The evolution of AI continues to expand the horizons of animal husbandry. Advancements in AI-powered robotics, genetic editing technologies like CRISPR, and the integration of IoT (Internet of Things) are poised to further revolutionize the industry. These developments hold the promise of more efficient, sustainable, and ethical livestock farming practices.

CONCLUSION

AI's integration into animal husbandry marks a pivotal moment in the agricultural sector. Its ability to optimize operations, improve animal welfare, and enhance productivity underscores its significance in shaping the future of sustainable and responsible farming practices. As technology advances and ethical frameworks evolve, embracing AI in animal husbandry presents an opportunity to meet the growing demand for food while prioritizing animal welfare and environmental sustainability.

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