

# **MONITORING AND DETECTION OF AMMONIA AND CARBON DIOXIDE IN POULTRY FARM**

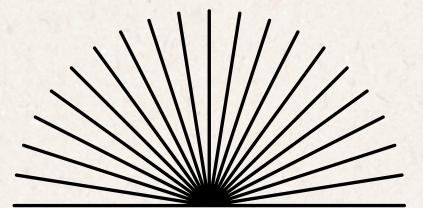
**Theme:** Promoting individual innovation

**NAME OF PROJECT:**

**PURAIR – Poultry Unified  
Respiratory Air Inspection &  
Regulation**

**PRESENTED BY:**

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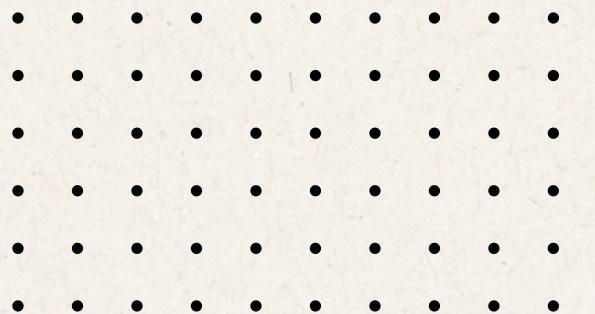


# Motivation

- Poultry farm air quality directly impacts bird health, egg production, and farm sustainability.
- Ammonia causes respiratory issues and immune suppression.
- Carbon dioxide indicates poor ventilation, increasing the risk of heat stress and suffocation.
- Real-time monitoring can ensure animal welfare and farm efficiency.

# Problem Statement

Current poultry farm environments often suffer from poor air quality due to the accumulation of gases like ammonia and carbon dioxide, and there is a significant lack of affordable, intelligent monitoring systems to address this issue. The existing technologies in place tend to operate on static thresholds, lacking any form of adaptive or predictive capabilities. This calls for the development of a smart, data-driven solution capable of real-time gas monitoring, predictive analysis, and automated ventilation control to enhance both poultry health and farm productivity.

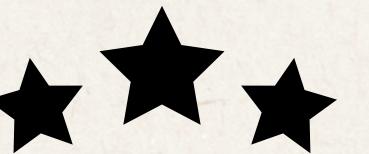


# Novelty of the Proposed Approach:



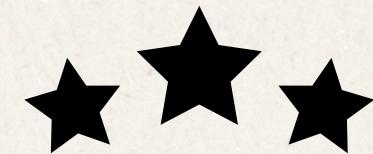
## Novelty # 1

IoT-enabled real-time monitoring system for NH<sub>3</sub> and CO<sub>2</sub>.



## Novelty # 2

AI/ML-based analytics for anomaly detection and predictions.



## Novelty # 3

Automated ventilation control based on gas levels.

# Methodology

- Select and calibrate sensors for NH<sub>3</sub> (electrochemical) and CO<sub>2</sub> (NDIR)
- Deploy sensors in poultry sheds
- Use Raspberry Pi/Arduino for data acquisition
- Transmit data via Wi-Fi/GSM to a cloud server
- Analyze data using AI/ML to detect trends and anomalies
- Control ventilation dynamically
- Dashboard for visualization and SMS/email alerts

# Market Potential

- Large poultry industry market with demand for air quality solutions
- Reduces losses due to disease and poor conditions
- Scalable to other livestock or greenhouse environments

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# Conclusion

This system introduces an intelligent and automated method for maintaining optimal air quality in poultry farms. By leveraging real-time data collection and AI integration, it significantly enhances animal welfare while improving economic viability for farm owners. Furthermore, the proposed solution demonstrates strong potential for scalability and commercial application across various farming environments.

# References

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# Thank you

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