Air Quality Monitoring and Enhancement System Using Microalgae Biofiltration

TEAM Design Term 232- Team 031

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Introduction

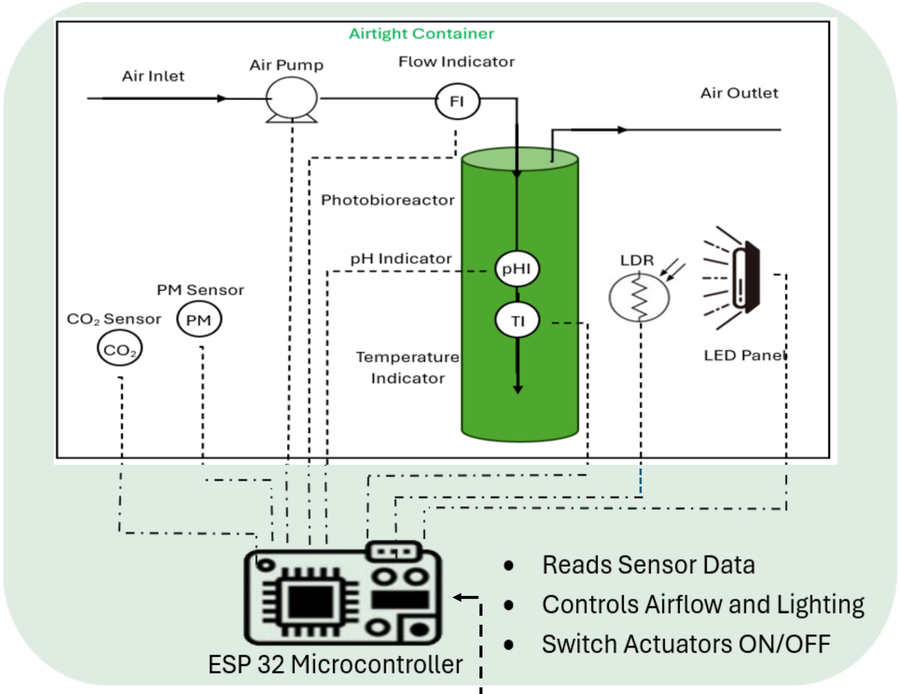
An air quality enhancement system using microalgae biofiltration to sustainably monitor and reduce critical pollutants like carbon dioxide.

Problem Statement

Indoor spaces like schools, hospitals, and apartments often have poor air quality due to limited ventilation and high carbon dioxide levels from human respiration, posing health risks.

Target Specification / Constraints

Target Specification	Constraints
Noise Level: Operates below 50 decibels.	Algae Cultivation Time
User Interface: User-friendly interface requiring zero learning time by users.	Temperature Tolerance: should operate within the typical range of 20-40°C.
Monitoring Accuracy: Sensors accurate to ±5% of the actual value.	Algae Saturation: Should manage to prevent exceeding algae's pollutant absorption capacity.
CO2 Reduction: Achieves a reduction rate of 4 g/L.	



Project Impact

Validation

Target Specification	Met
Noise Level: Operates below 50 decibels.	✓
User Interface: User-friendly interface requiring zero learning time by users.	✓
Monitoring Accuracy: Sensors accurate to ±5% of the actual value.	✓
CO2 Reduction: Achieves a reduction rate of 4 g/L.	✓

Conclusion

A significant step forward in air quality solutions, our system uses microalgae biofiltration for sustainability and includes a mobile app for real-time monitoring and control.