

Honey Bee Health Monitoring System

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Abstract: *Beekeeping plays a vital role in global agriculture, and maintaining optimal hive temperature is critical for the well-being and productivity of bee colonies. This abstract introduces an innovative automated system designed to monitor and control hive temperature in beekeeping operations. The system leverages modern technology and data-driven techniques to ensure the optimal environmental conditions for bee colonies. The proposed system consists of a network of temperature sensors strategically placed within beehives, data loggers, and a centralized control unit. These sensors continuously monitor the temperature and humidity levels inside the hives, providing real-time data that is wirelessly transmitted to the control unit. The control unit processes this data and makes necessary adjustments to maintain the desired temperature range within the hives. This includes activating cooling or heating elements, adjusting ventilation, or controlling shade structures. The system provides beekeepers with real-time access to temperature and humidity data via a user-friendly interface, allowing for remote monitoring and instant awareness of hive conditions. The system's control unit can automatically adjust environmental conditions, such as heating or cooling, based on pre-defined thresholds to maintain the ideal hive temperature.*

Keywords: Honey bee

REFERENCES

- [1]. Murphy, F.E.; Magno, M.; Whelan, P.; Vici, E.P. b+ WSN: Smart beehive for agriculture, environmental, and honey bee health monitoring—Preliminary results and analysis. In Proceedings of the 2015 IEEE Sensors Applications Symposium (SAS), Zadar, Croatia, 13–15 April 2015; pp. 1–6.
- [2]. Murphy, F.E.; Magno, M.; O'Leary, L.; Troy, K.; Whelan, P.; Popovici, itoring of beehive imagery and sound. In Proceedings of the 2015 6th International Workshop on Advances in Sensors and Interfaces (IWASI), Gallipoli, Italy, 18–19 June 2015; pp. 106–111.
- [3]. Chazette, L.; Becker, M.; Szczerbicka, H. Basic algorithms for bee hive monitoring and laser-based mite control. In Proceedings of the 2016 IEEE Symposium Series on Computational Intelligence (SSCI), Athens, Greece, 6–9 December 2016; pp. 1–8.
- [4]. Gil-Lebrero, S.; Quiles-Latorre, F.J.; Ortiz-Lo'pez, M.; Sa'nchez-Ruiz, V.; Ga'miz-Lo'pez, V.; Luna-Rodr'iguez, J.J. Honey bee colonies remote monitoring system. *Sensors* 2017, 17, 55.
- [5]. Kvisis, A.; Zacepins, A.; Durgun, M.; Tekin, S. Application of wireless sensor networks in precision apiculture. *Eng. Rural Dev.* 2015, 20, 440–445.
- [6]. Yang, C.; Collins, J. A model for honey bee tracking on 2D video. In Proceedings of the 2015 International Conference on Image and Vision Computing New Zealand (IVCNZ), Auckland, New Zealand, 23–24 November 2015; pp. 1–6.
- [7]. Yang, C.; Collins, J.; Beckerleg, M. A Model for Pollen Measurement Using Video Monitoring of Honey Bees. *Sens. Imaging* 2018, 19, 2
- [8]. Yang, C.; Collins, J. Improvement of honey bee tracking on 2D video with hough transform and Kalman filter. *J. Signal Process. Syst.* 2018, 90, 1639–1650.

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