Balance Temperature, Conveniently: Designing an Affordable and Easy-to-Implement Wireless Zoning System

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Conventional HVAC mechanisms are prone to irregular temperature distribution, creating discomfort and wastes energy. This project details the development and implementation of a standalone wireless zoning network capable of equalizing temperatures among rooms based on a previously verified and tested wired model. An array of devices was constructed and programmed from the Arduino development platform with the ability to operate wirelessly using low-cost 24-GHz radio communicators. Additionally, the ability to regulate airflow rates via fan speed control was implemented in order to preserve the integrity of HVAC infrastructure. The completed prototype was successful as it did not require smartphones or Wi-Fi to operate wirelessly, demonstrated no losses in performance and capability when compared to its wired base, controlled simulated airflow speeds in response to vent activity, and maintained a relatively low cost of construction.

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