

Audio Spectrum Analyser using Arduino Nano for Automation Applications

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Abstract: *This paper explores the design and implementation of an audio spectrum analyser using the Arduino Nano microcontroller. While traditionally employed for visualizing audio frequencies, this project focuses on leveraging the spectral analysis capabilities for automation applications. We examine the hardware and software considerations in creating a low-cost, portable spectrum analyser, highlighting the challenges and solutions involved in processing audio signals with limited computational resources. Furthermore, we delve into potential use cases within the automation sector, discussing how frequency analysis can be integrated into systems for predictive maintenance, noise monitoring, process control, and environmental monitoring. The paper concludes by outlining future research directions and potential improvements to enhance the accuracy and applicability of the Arduino-based spectrum analyser in demanding automation scenarios*

Keywords: Arduino Nano, Audio Spectrum Analyser, FFT, Automation, Predictive Maintenance, Noise Monitoring, Frequency Analysis, Signal Processing