Advanced Real Time Systems

Pressure Cooker Monitoring System: Real-Time Kitchen Safety Solution

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Overview: The Pressure Cook Monitoring System is a real-time application designed to ensure kitchen safety. It functions by acoustically monitoring the number of whistles emitted by a pressure cooker in real time, alerting users promptly upon completion of the cooking cycle. This intervention is critical in preventing both overcooking and the potential hazards associated with excessive pressure buildup.

Working Principle: The application utilizes a sophisticated trained model that runs on the user's device. Through a combination of audio signal processing and machine learning techniques, it reliably detects the distinct sound signature of a pressure cooker's whistle. Upon detecting a whistle, the system increments a count, continuously comparing it against a user-defined threshold. Once the count meets the specified number of whistles, the application triggers an audible alarm and sends a notification to the user, signifying the end of the cooking cycle.

Core Components:

- 1. Audio Monitoring: Real-time ambient sound capture through device's microphone.
- 2. Signal Analysis: Immediate audio data conversion and frequency isolation.
- 3. Whistle Detection: Machine learning model for real-time whistle recognition.
- 4. User Alerts: Instantaneous notifications when whistle count meets user defined threshold.
- 5. System Interface: Simple UI for setting preferences and monitoring status.

System Requirements

- 1. A microphone-enabled device capable of executing background processes.
- 2. Real-time capable software for audio signal analysis and pattern recognition.
- 3. Notification System: Generates an alarm upon the correct whistle count, prompting the user for intervention.

Real-Time Significance

The application's real-time processing capability ensures immediate and accurate response to acoustic events, a critical factor for the user's safety and the integrity of the cooking process. The real-time nature of the system is evident by immediate processing, deterministic response, resilience and reliability.