Soundscapes in ICU: A New Dimension in Patient Care

Project Overview

This project is a novel endeavor focused on analyzing the sound environment within the Neonatal Intensive Care Unit (NICU) and Pediatric Intensive Care Unit (PICU). It seeks to understand how sound environment quality influences the decision-making process of nursing staff and affect patients' sleep behaviors. By integrating soundscape evaluation metrics and sound event prediction algorithms, the project aims to provide new insights into sound monitoring within these specialized units.

Key Findings

Several significant insights emerged during the project's development. The analysis of sound attributes such as loudness, roughness, sharpness, and harmoniousness allowed for an objective evaluation of eventfulness and pleasantness.A unique combination of sound collection, data processing, information storage, and deployment methods was developed, leading to a functional product prototype. Synthesized audio was used to simulate real ICU sound environments, revealing new opportunities and challenges that call for further exploration.

Introduction of the Final Design

The final design is a multifaceted tool (Web UI format) that caters to the specific sound environment within NICU and PICU. By offering visually accessible formats, the tool makes sound event data understandable for the nursing staff. Moreover, it opens the possibility for real-time processing capabilities and the increased assessment of eventfulness and pleasantness, ensuring that the tool stays aligned with the conditions of the ICU.

Conclusions

The project manifests an innovative approach to understanding and engaging with sound within the specialized realms of NICU and PICU. Through technological exploration, rigorous testing, and real-world adaptation, the project illuminates the potential of sound as a nuanced tool for analysis and communication in critical healthcare environments. The journey from conception to realization not only fulfills the initial goals of the project but also offers a foundation for future development. It sets a thoughtful path towards more empathetic, efficient, and informed care within these highly specialized care settings, inviting further exploration and research to refine and expand upon the strategies and insights uncovered.

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Sound environment monitoring system in NICU/PICU
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