ECOLE MAROCAINE DES SCIENCES DE L'INGENIEUR

Team: ECHOLYTIX

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ALGORITHM & PROTOTYPE

Prototype Description:

We developed a working prototype integrating a noise classification algorithm (CNN-based) trained on urban sound datasets and an NLP model for sentiment analysis of citizen complaints. The system outputs real-time heatmaps of noise levels using GPS and metadata, visualized through a web dashboard.

The prototype is available on GitHub: https://github.com/mounseflit/ECHOLYTIX

Feedback Questions:

1. Does the dashboard clearly reflect your area's noise situation?
2. Is the real-time feedback from the sensors helpful?
3. Do you trust the interpretation of citizen complaints in the system?
4. What functionalities would you like to see added?
5. How would this solution fit in your daily decision-making as a policymaker or citizen?

Initial Results & Interpretations:

- Noise classification reached 87% accuracy on test audio clips.
- Sentiment analysis on a sample of 100 citizen complaints gave 79% agreement with human annotations.
- Stakeholders appreciated the visual clarity of the noise heatmaps.
- Feedback indicates demand for mobile alerts and historical trend comparison.

Focus Areas for Testing:

We aim to test clarity of visualizations, accuracy of noise labeling, and relevance of NLP analysis to guide municipal actions. The prototype enables rapid iteration on interface, model thresholds, and data sources.