Urban Air Quality Modelling

Sensor networks and machine learning

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Overview

1 Motivation
- Why it matters

2 Approach
- Sensor network
- Model

3 Results

Why air quality modelling matters

- Low-cost sensors let cities monitor pollution block by block
- Machine learning fills gaps between sparse fixed stations
- Better models mean better public health interventions

Sensor deployment

Sensor type	Count	Update interval
Reference station	12	1 hour
Low-cost node	340	5 minutes
Mobile (bus-mounted)	18	Continuous

Two columns

Inputs

- Traffic flow
- Weather and wind direction

Outputs

- Hourly PM2.5 estimate per block
- Confidence interval

What we found

1. Model matches reference stations within 8% mean error
2. Traffic corridors show the sharpest pollution gradients