

CREST

M.TECH · THESIS DEFENCE

Low-Cost IoT Air Quality Monitoring Network

M.Tech Thesis Defence

CANDIDATE

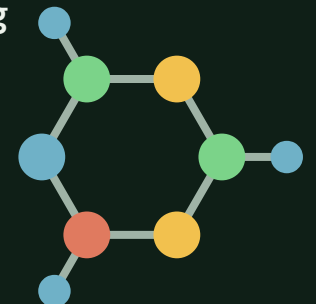
Research Scholar Name

SUPERVISOR

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DEPARTMENT

Electronics Engineering



Agenda



01

Background

02

Research questions

03

Methodology

04

Findings

05

Contribution

Background and motivation

- ▶ Urban air quality varies street by street
- ▶ Official monitors are few and costly
- ▶ Low-cost sensors could fill the gaps

RESEARCH GAP

Low-cost sensors drift and need calibration before city-scale use.

Research questions

01

RQ1

How accurate are calibrated
low-cost sensors?

02

RQ2

Can a mesh network cover a
campus?

03

RQ3

Which calibration model works
best?

Related work

Theme	Key findings	What is missing
Theme A	Established baseline methods	Limited to lab settings
Theme B	Recent data-driven approaches	Small, narrow datasets
Theme C	Field studies	No comparative evaluation

Summarise your literature here.

Research design

1

Build

12 sensor nodes

2

Co-locate

Next to a reference monitor

3

Calibrate

Regression and ML models

4

Deploy

Campus-wide network

Data and sample

12

sensor nodes

6

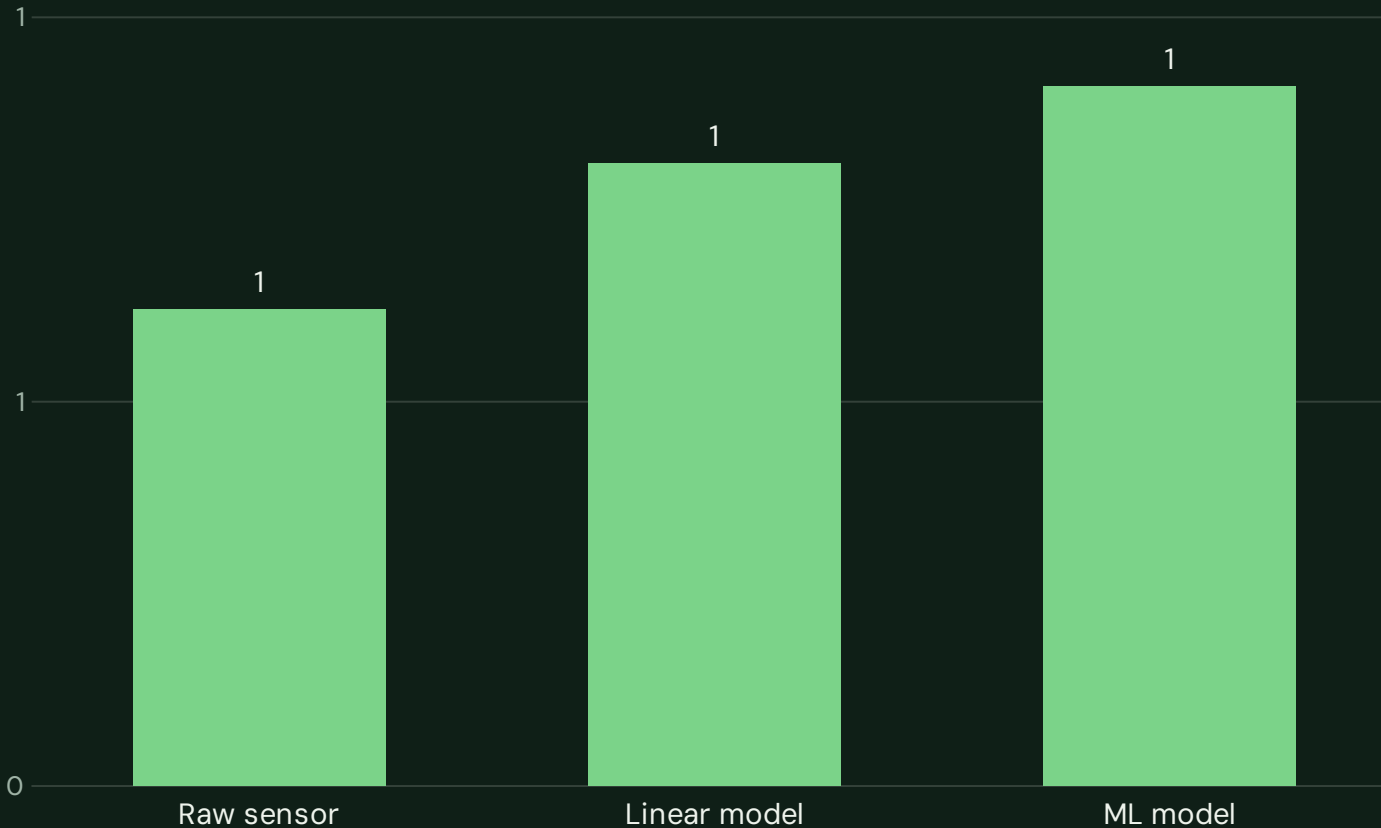
months of data

1

reference station

Describe your own dataset.

Key result



Agreement with the reference monitor (sample data).

Sample data for illustration — replace with your own figures.

Findings vs hypotheses

Hypotheses

- ✓ Calibration improves accuracy
- ✓ Mesh covers the campus
- ✓ ML beats linear models

What we found

- R^2 rose to 0.91
- 95% data delivery
- ML model performed best

Contributions



01

Hardware

Open low-cost node design.

02

Method

Calibration pipeline.

03

Data

Campus air map.

Limitations and future work

- ▶ One season only
- ▶ Single campus
- ▶ Sensor ageing not studied



Publications

- ▶ Paper 1 — journal name, year (published)
- ▶ Paper 2 — conference name, year (accepted)
- ▶ Paper 3 — journal name (under review)



Image

Thank you

I welcome your questions.

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