

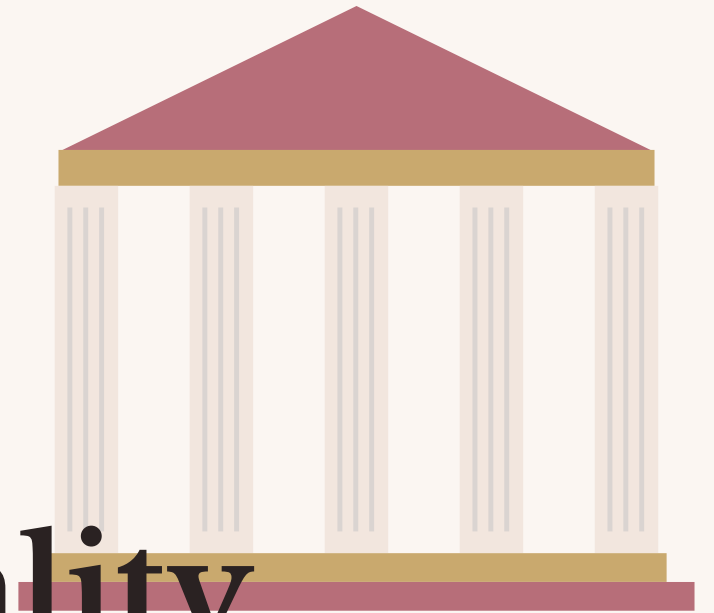
M.TECH • THESIS DEFENCE

26

Low-Cost IoT Air Quality Monitoring Network

M.Tech Thesis Defence

Research Scholar Name • Prof. Supervisor Name • Electronics Engineering



Agenda

01

Background

02

Research questions

03

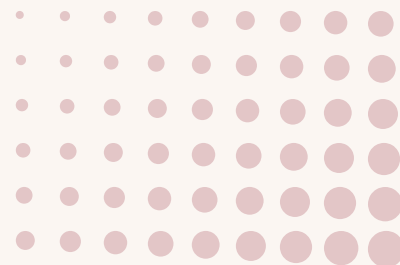
Methodology

04

Findings

05

Contribution

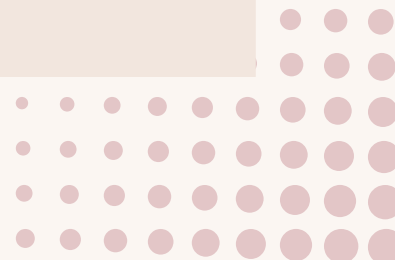


Background and motivation

- ▶ 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.



01

RESEARCH QUESTIONS

Research questions

01

RQ1

How accurate are calibrated low-cost sensors?

02

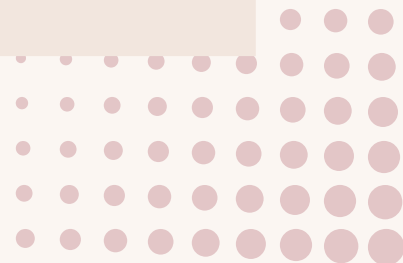
RQ2

Can a mesh network cover a campus?

03

RQ3

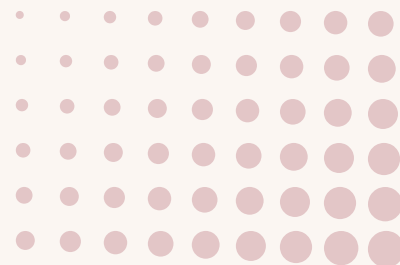
Which calibration model works best?



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

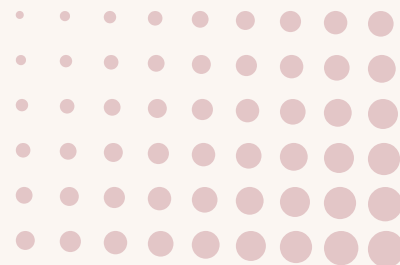
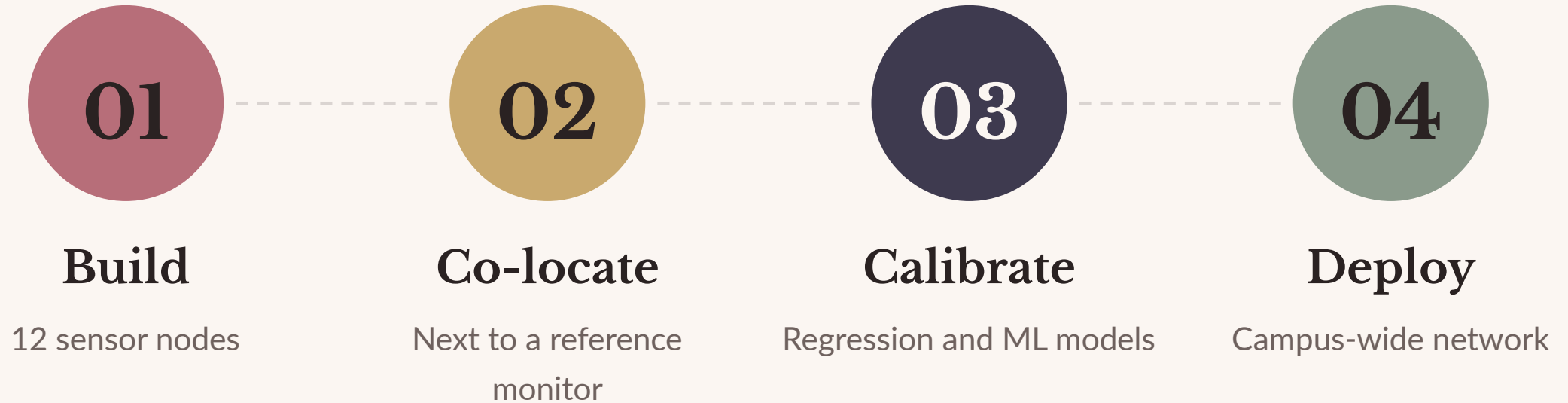
Summarise your literature here.



02

METHODOLOGY

Research design



Data and sample

12

sensor nodes

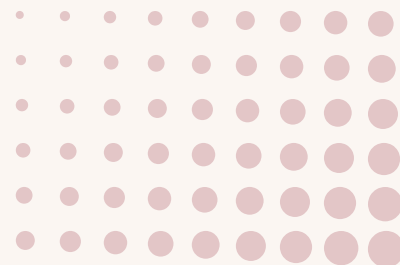
6

months of data

1

reference station

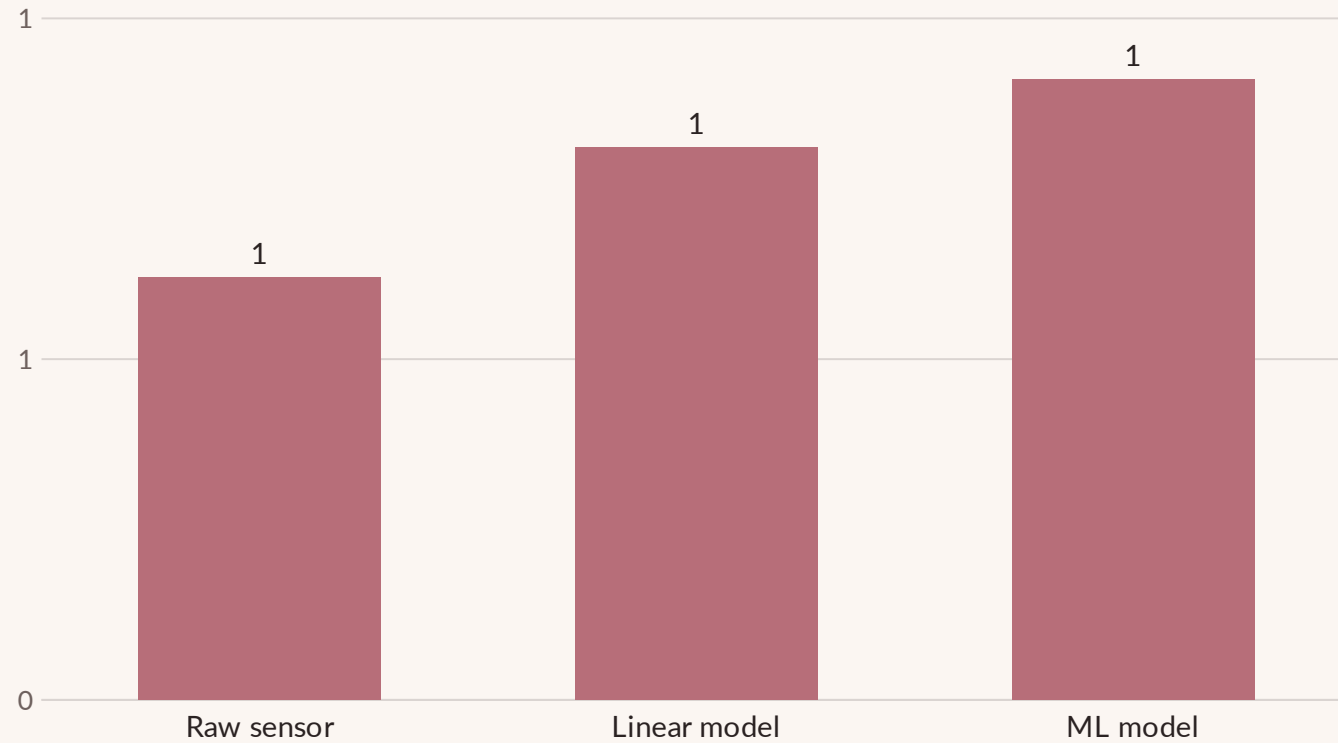
Describe your own dataset.



03

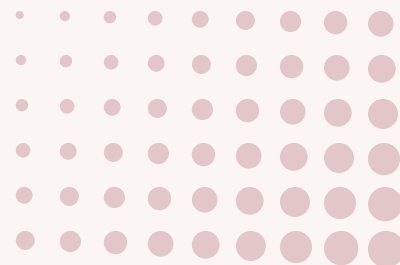
FINDINGS

Key result



Agreement with the reference monitor (sample data).

Sample data for illustration — replace with your own figures.



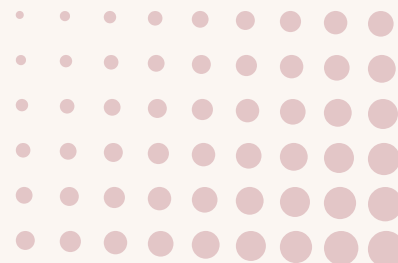
Findings vs hypotheses

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



04

CONTRIBUTION

Contributions

01

Hardware

Open low-cost node design.

02

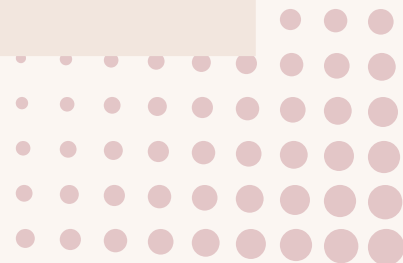
Method

Calibration pipeline.

03

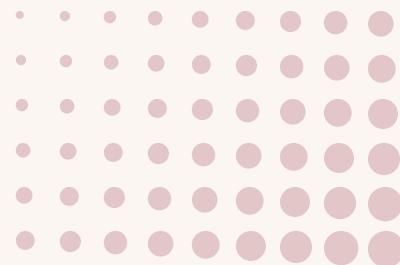
Data

Campus air map.



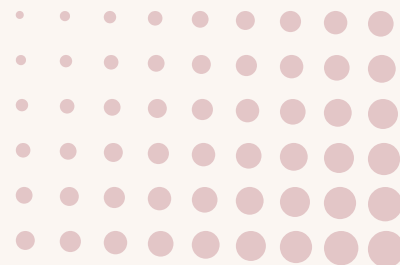
Limitations and future work

- ▶ 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)



Thank you

I welcome your questions.

Research Scholar Name · scholar@university.ac.in