Proposing Energy Efficient Urban Spaces Using IoT and Data Visualisation

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Introduction

A major problem towards energy conservation is the apathy of the civilian administration, using outdated technology and lack of a mechanism to monitor energy wastage.

The project is an algorithm to simplify and aid into the process.

Motivation

6 of the UNDP Goals, the recent hype around smart cities and a pan-global understanding of the ills of global warming mean that tools to mitigate or work through the problem have become increasingly necessary.

SCOPE of the Project

The project is intended to establish a chain of actions that should felicitate the interaction between public and private bodies to minimize energy wastage.

While the private household/office is alone sufficient too, however, the maximum efficiency will be evident only as the data points become larger.

Methodology

Proposed Algorithm

The algorithm proposed here forms the core of the study
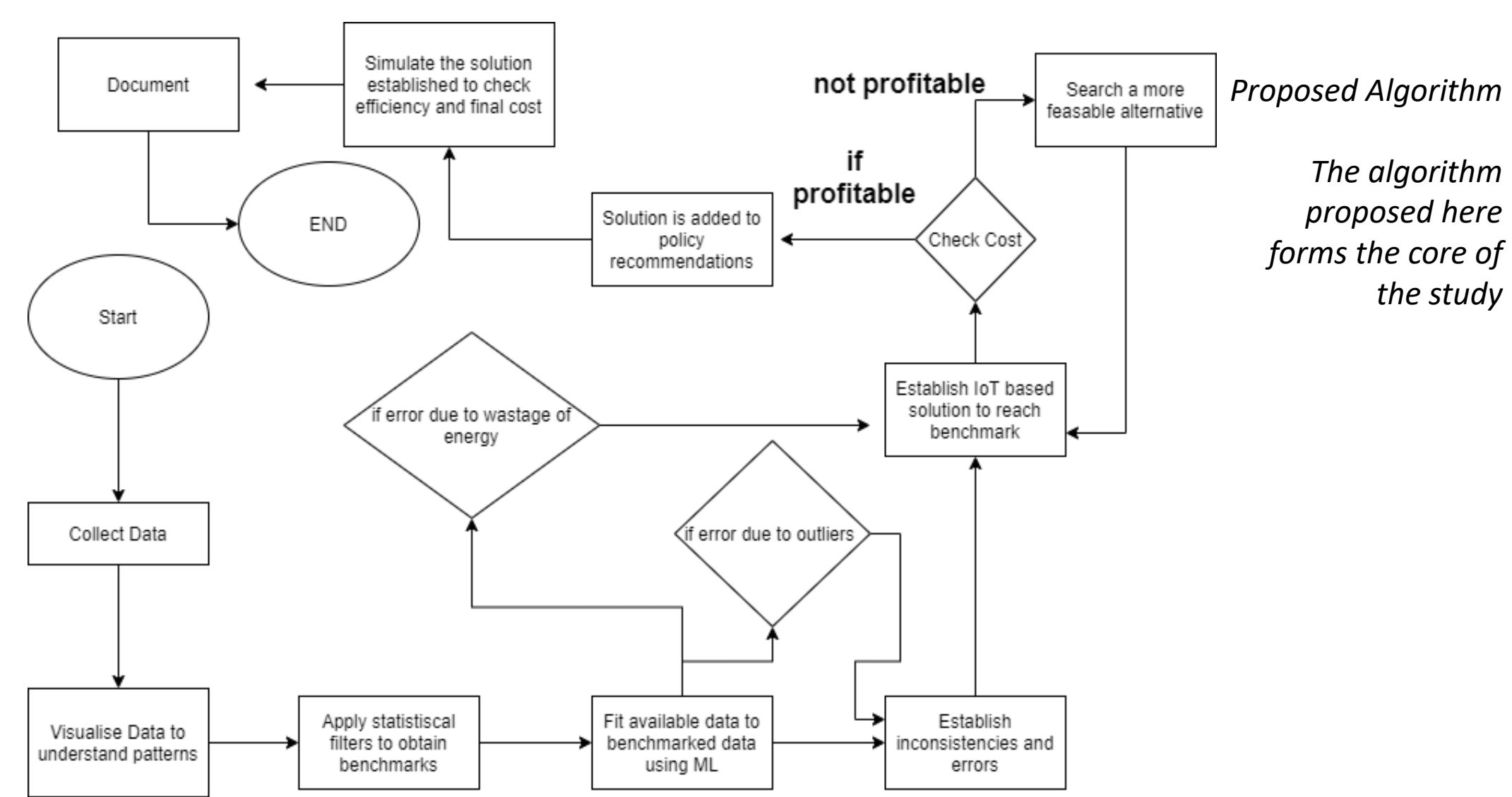
The project takes the following as the core principles –

1. The wastage of energy can be minimized by automation

2. Wastage of energy can be minimized by new technologies

3. Wastage of energy can be minimised by monitoring

4. People will accept such measures if they are cheap, efficient and profitable.

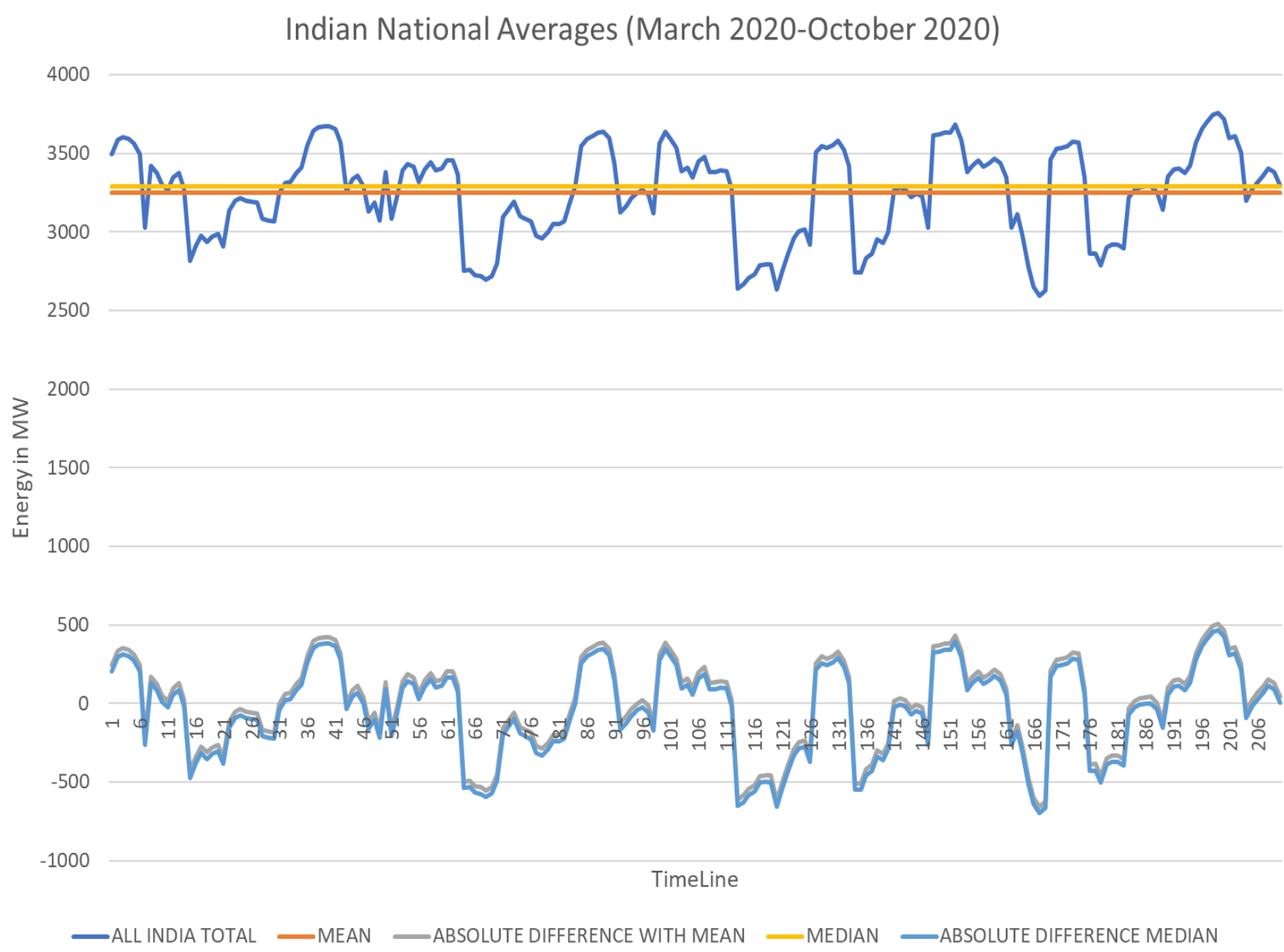And, the methodology involved:

1. Collecting Data

2. Cleaning Data

3. Benchmarking Data

4. Comparing benchmarking standards

5. Identifying tools

6. Simulating a real-world case

7. Estimating costs and comparing against real-world costs

8. Minimizing costs

The simulation setup

A generic office scenario was set-up in CISCO Packet Tracer

Results

The median shows the least seasonal deviation among all central tendencies. NN based systems are too expensive.

The organisation will overcome costs involved within 3 years of installation

Conclusion

The algorithm has been tested on real-world data whilst simulating a very common scenario in the world – an office. The algorithm shows strong promise to fill in the gaps experienced in the modern set-up of smart cities and the general outlook towards IoT devices and energy wastage of any kind.

However, when deployed with a dataset of equivalent to the population of an entire city like the ones in our case studies and with the granularity of a household or office, the means to assess the data might change.

References

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