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BRB based Deep Learning Approach with Application in Sensor Data Streams

Author: Sami Kabir

Supervisors: Prof. Dr. Md. Shahadat Hossain
University of Chittagong, Bangladesh

Prof. Dr. Karl Andersson
Lulea University of Technology, Sweden

INTRODUCTION

- Recent advancement in sensor devices and wireless sensor network has turned sensor data streams into an effective application area.
- Air Pollution is responsible for around 7 million deaths every year.
- Motivated by this, we have taken air pollution prediction by evaluating sensor data stream of air pollutants as our application area.

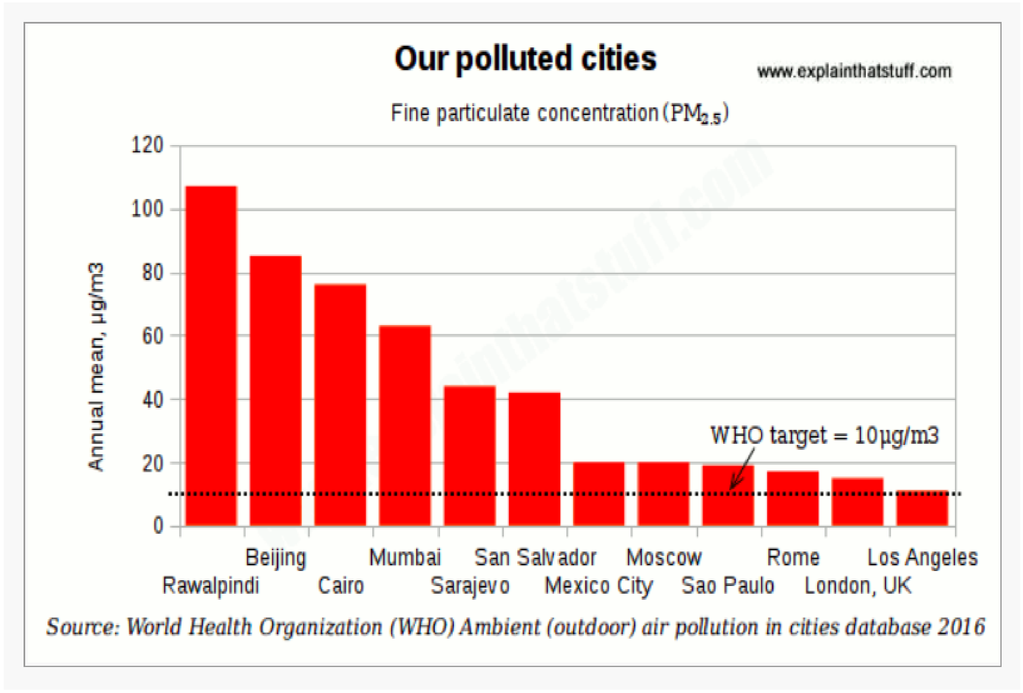

Figure 1: Annual mean $PM_{2.5}$ level in 12 cities from [2]

OBJECTIVES

- Identification of major air pollutants.
- Development of BRB Expert System (BRBES) to deal with uncertainties of air pollutants' sensor data.
- Development of BRB based deep learning model to predict air pollution by discovering sensor data pattern.
- Integration of deep learning model with BRBES to improve prediction accuracy by combining knowledge with data.

RESEARCH QUESTIONS

- How to integrate Deep Learning with BRB?
- How this integration improves prediction accuracy?
- Why will we use BRB and Deep learning for this prediction?

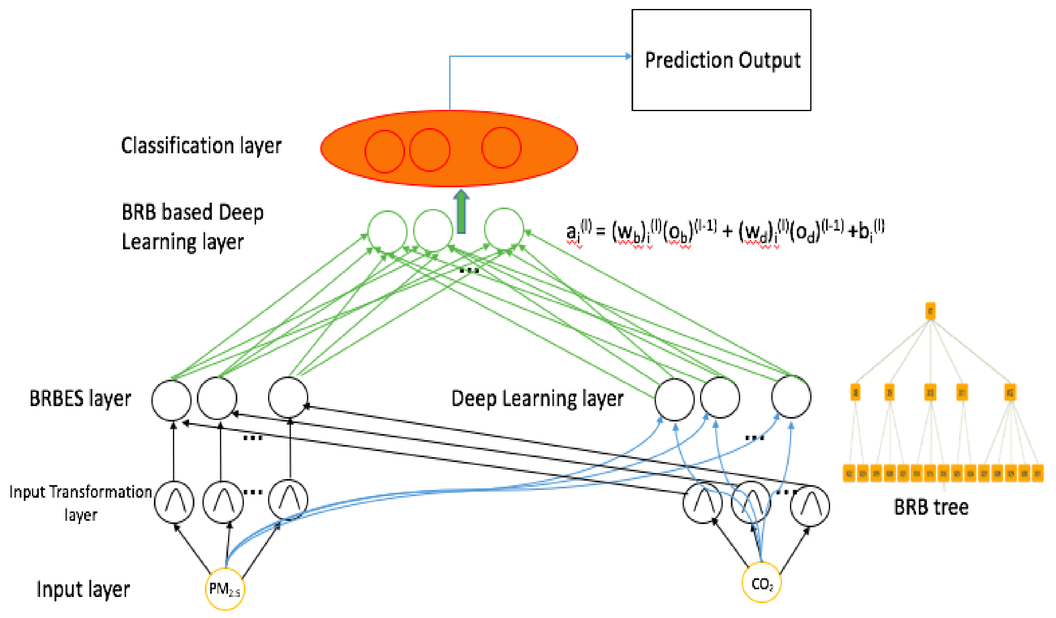

Figure 2: Conceptual Architecture

METHODOLOGY

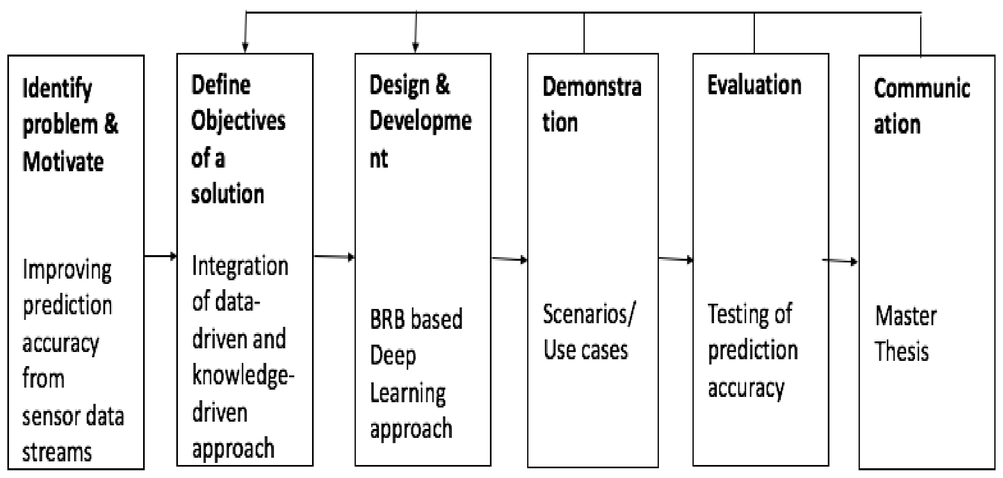

Figure 3: Design Science Research (DSR) Methodology adapted from [6]

Literature Review

- How to deal with sensor data uncertainties?
- What are the existing deep learning techniques for generating prediction?
- What are the major air pollutants?

CONCLUSION & NEXT STEPS

- Implement the proposed conceptual architecture.
- Extensively train BRB based deep learning model to deal with uncertainties and sensor data pattern.
- Comparative study of other prediction models.

REFERENCES

Contact:
Sami Kabir
Cohort-5, Erasmus Master PERCCOM
sami.kabir@student.lut.fi

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