ReportTitel

A dissertation-I submitted to the Mahatma Gandhi Central University
in partially fulfillment of the requirements
for the award of the degree of

MASTER OF TECHONOLGY

IN

COMPUTER SCIENCE & ENGINEERING

BY

STUDENT NAME IN UPER CASE

DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGY
MAHATMA GANDHI CENTRAL UNIVERSITY,
MOTIHARI, BIHAR - 845401, INDIA

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कंप्यूटर विज्ञान और सूचना प्रौद्योगिकी विभाग
Department Of Computer Science And Information Technology
महात्मा गाँधी केन्द्रीय विश्वविद्यालय, बिहार-८४५४०१
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MOTIHARI, BIHAR - 845401, INDIA

DECLARATION

This is to certify that the dissertation-I entitled **" ReportTitel"** is being submitted to the **Department Of Computer Science And Information Technology, Mahatma Gandhi Central University, Motihari, Bihar - 845401, India** in partial fulfillment of the requirements for the award of the degree of **course name(Master of Technology)** in **Computer Science & Engineering**, is a record of bonafide work carried out by me under the supervision of **"Supervisor Name, Department Of Computer Science And Information Technology, Mahatma Gandhi Central University, Motihari, Bihar - 845401, India."**

The matter embodied in the dissertation has not been submitted in part or full to any University or Institution for the award of any other degree or diploma.

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"I am enough of an artist to draw freely upon my imagination. Imagination is more important than knowledge. For knowledge is limited, whereas imagination encircles the world."

Albert Einstein

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CERTIFICATE

This is to certify that the dissertation-I entitled **"ReportTitel"** submitted by **Student Name** to the **Department Of Computer Science And Information Technology, Mahatma Gandhi Central University, Motihari, Bihar - 845401, India** for the award of the degree of **course name(Master of Technology)** in **Computer Science & Engineering**, is a research work carried out by him under the supervision of **"Supervisor Name, Department Of Computer Science And Information Technology, Mahatma Gandhi Central University, Motihari, Bihar - 845401, India."**

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Abstract

Paragraph

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Student Name
(STUDENT ENROLMENT NUMBER)
M.Tech(CSE)

List of Publications

1.titel of publication
publishar
Authors - **Student Name** and Vipin Kumar

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List of Abbreviations

ML	**Machine Learning**
DL	**Deep Learning**
CNN	**Convolutional Neural Network**

List of Symbols

D	**Dataset**
N	**Number of data points**
$y(i)$	i^{th} **measurement**

Dedicated
to
Maa, and Papajee

Chapter 1

Introduction

1.1 Introduction

Paragraph1

Paragraph2

Paragraph3

Chapter 2

Literature Review

2.1 Literature Review

Paragraph

Paragraph

Table 2.1 REFRENCE OF TABLE

TABLE 2.1: Summarizing of Related work to pridict $PM_{2.5}$

Paper	**Proposed Model**	**Data Source**	**Forecasting Object**	**Benchmark Models**	**Results**
...	...	...	...	...	...

Chapter 3

Basics Related Roncepts

3.1 Basics Related Roncepts

3.1.1 Machine Learning

Paragraph

Chapter 4

Methodology

4.1 Methodology

TABLE 4.1: 17 Indian cities dataset, with start and end dates and sample counts.

DataSets	**Fast_Day**	**Last_Day**	**No of Samples**
BHIWADI	20-12-2017 15:00	02-12-2022 16:00	43394
JODHPUR	01-12-2015 00:00	02-12-2022 16:00	61409
SINGRAULI	08-12-2017 11:00	03-12-2022 01:00	43695
ANKLESHWAR	04-02-2019 18:00	03-12-2022 00:00	33535
LUDHIANA	01-05-2017 00:00	03-12-2022 01:00	49010
DURGAPUR	06-12-2020 15:00	03-12-2022 00:00	17434
YAMUNA_NAGAR	03-01-2019 14:00	02-12-2022 16:00	34299
CHARKHI_DADRI	03-03-2020 15:00	02-12-2022 17:00	24099
JIND	10-01-2019 09:00	03-12-2022 01:00	34145
KURUKSHETRA	07-01-2019 18:00	03-12-2022 01:00	34208
SONIPAT	01-01-2019 00:00	02-12-2022 17:00	34362
DHARUHERA	04-01-2019 12:00	02-12-2022 04:00	34265
AMBALA	08-01-2019 12:00	02-12-2022 09:00	34174
HISAR	10-01-2019 10:00	03-12-2022 00:00	34143
FATEHABAD	09-01-2019 10:00	02-12-2022 17:00	34160
BULANDSHAHR	16-05-2018 13:00	02-12-2022 17:00	39869
MUZAFFARNAGAR	01-07-2018 00:00	03-12-2022 01:00	38786

Table 4.1 :

Chapter 5

Results and Analysis

5.1 Results and Analysis

TABLE 5.1: All Datasets RMSE.

DataSets	BiLS-TM	CNN	GRU	Seq2-Seq	V-LSTM	S-LSTM	CNN_Bi-LSTM	CNN_LSTM	GRU_Bi-LSTM
BHIWADI	23.13	57.2	22.34	24.2	19.6	48.14	45.98	43.5	35.3
JODHPUR	27.54	26.68	32.94	22.35	22.08	50	40.87	43.55	52.63
SINGRAULI	10.92	15.5	27.34	21.61	13.63	17.79	50.61	22.2	26.5
ANKLESHWAR	18.53	16.68	37.15	23.78	18.38	46.28	62.85	68.72	69.38
LUDHIANA	8.4	11.12	22.14	10.1	8.3	21.15	25.66	24.76	23.77
DURGAPUR	6.14	8.27	20.34	9.48	8.78	15.28	9.62	13.76	24.39
YAMUNA_NAGAR	37.34	34.57	56.27	36.33	38.18	66.14	72.39	45.63	74.13
CHARKHI_DADRI	18.42	20.43	27.96	18.43	18.06	40.71	46.16	45.27	43.48
JIND	24.17	26.42	34.35	25.85	19.41	79.22	62.13	43.59	50.95
KURUKSHETRA	27.14	72.03	43.56	27.32	26.7	65.77	39.71	88.12	53.74
SONIPAT	12.56	15.98	22.4	15.41	10.9	43.02	24.01	22.96	46.77
DHARUHERA	26.74	28.93	34.6	24.06	25.19	53.18	31.93	35.01	46.22
AMBALA	22.58	28.96	41.08	19.92	16.92	57.43	40.71	34.14	63.85
HISAR	28.34	66.79	47.93	33.98	30.99	63.29	43.16	49.1	62.46
FATEHABAD	14.37	38.36	72.71	15.51	15.58	38.38	74.38	76.75	72.64
BULANDSHAHR	7.39	8.87	19.79	11.19	7.2	14.98	9.61	13.16	11.51
MUZAFFARNAGAR	11.88	16.13	13.72	14.2	12.75	22.21	15.91	23.6	21.9

TABLE 5.2: Average Rankings of RMSE by (N*N) Friedman Test

Algorithm	Ranking
BiLSTM	2.1176
CNN	4.2941
GRU	5.7059
Seq2Seq	3.1176
V-LSTM	1.7059
S-LSTM	7.1176
CNN-BiLSTM	6.5294
CNN-LSTM	6.9412
GRU-BiLSTM	7.4706

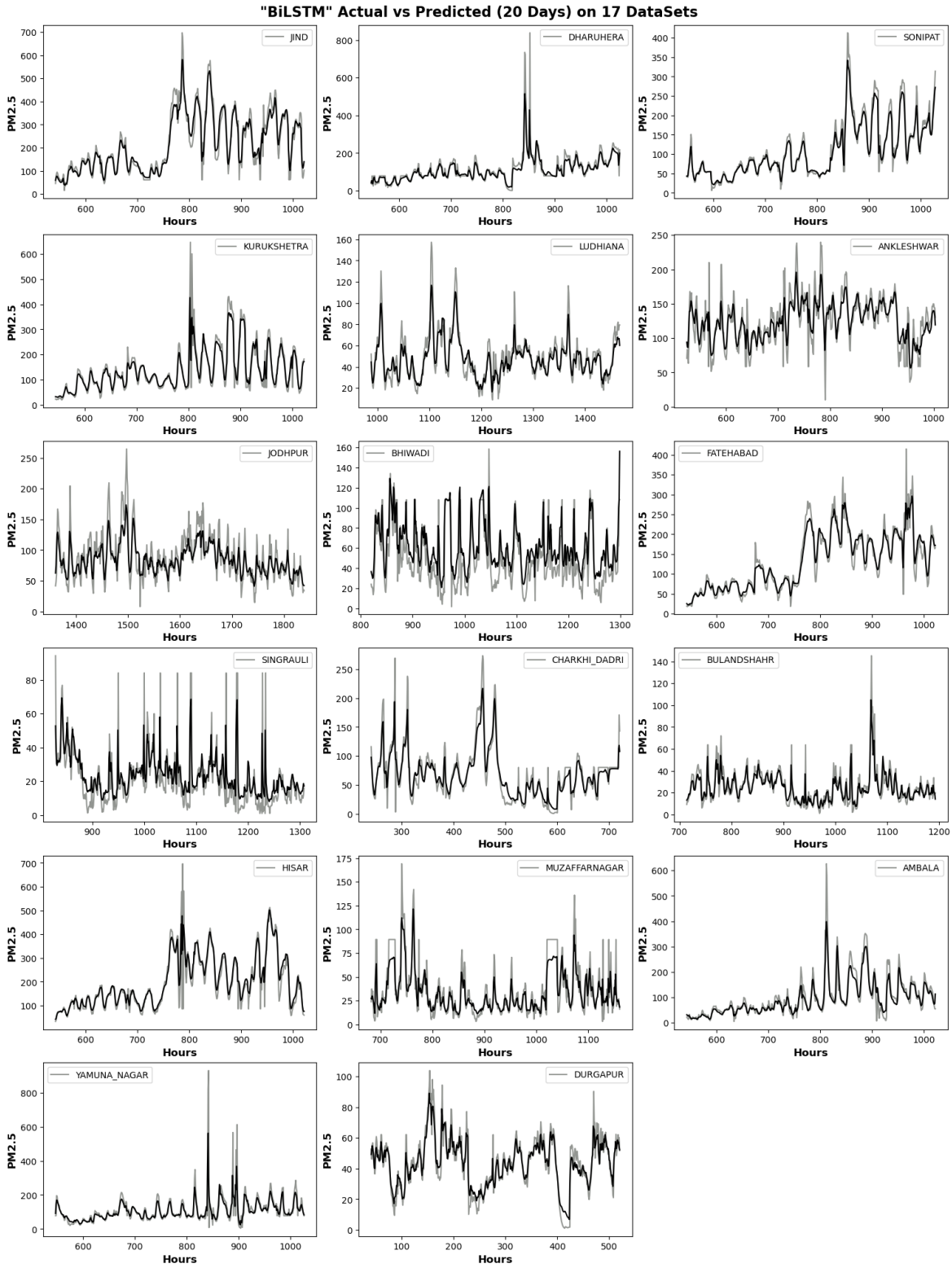

FIGURE 5.1: Actual vs Predicted of BiLSTM for All Datasets

Chapter 6

Conclusion

6.1 Conclusion