

DEPARTMENT OF COMPUTER SCIENCE

II Project Presentation (KCS 753)

DRIVER ANALYSIS FOR ENHANCING ROAD SAFETY

Project Id: PCS 24-56

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PROBLEM STATEMENT



Limitations of Existing Driver Monitoring Systems:

- Focus on basic parameters like speed and location.
- Limited insights into actual driving behavior.

Promoting Responsible and Safe Driving:

- It's major part of the project's mission.
- Cultivating a culture of responsible and safe driving practices.

Project Background:

- Recognizes the need for an intelligent driver analysis system.
- Going beyond traditional monitoring solutions.



OBJECTIVES

01

The main objective of the project is to improve road safety and reduce the number of accidents caused by unsafe driving behavior.

02

It will also help fleets to improve their operational efficiency and reduce their costs.

03

Some secondary objectives include:

- ✦ Reduce fuel consumption
- ✦ Increase productivity

- ✦ Enhance driver training
- ✦ Efficient monitoring

TECHNOLOGY USED

01

Database System

02

Data Analytics Tool

03

Python (Programming Language)

04

SVM / Random Forest (Machine learning algorithm)

LITERATURE SURVEY



PAPER 1: ANALYZING OBJECTIVE AND SUBJECTIVE DATA IN SOCIAL SCIENCES: IMPLICATIONS FOR SMART CITIES

Authors: L. ERHAN , M. NDUBUAKU , E. FERRARA , M. RICHARDSON , D. SHEFFIELD, F.J. FERGUSON , P. BRINDLEY, A. LIOTTA

Journal Name: IEEE

Year of publishing:2017

- The study involves a field experiment carried out in UK on around 1870 people for two different time periods. Data for analysis is collected with the help of a Smartphone app. It is used to collect location of the user.
- Also it is used to collect some pictorial data for better understanding. With all this data in hand, it is analysed through data science techniques and then machine learning algorithms are applied to analyse how people interact with their surrounding green spaces.

PAPER 2: ORDERLINESS PREDICTS ACADEMIC PERFORMANCE: BEHAVIOURAL ANALYSIS ON CAMPUS LIFESTYLE

Author name: Yi Cao , Jian Gao, Defu Lian , Zhihai Rong, Jiatu Shi, Qing Wang, Yifan Wu, Huaxiu Yao, Tao Zhou
Publisher: IEEE Year of publishing: 2018

- The study tries to predict some qualitative data on campus lifestyle of students. A set of 18960 students are picked for the analysis. The data is collected through smart cards given to students for this purpose. This data basically includes their shower time and meal time to calculate their orderliness and their library in and out timings to calculate their diligence.
- Shower time and meal time help us in evaluating the student's orderliness i.e. the quality of being well arranged or organized. Furthermore library in out timings help us to calculate diligence i.e. how persistent a student is towards their goal.

PAPER 3: ANALYSIS OF DISTRACTED DRIVER BEHAVIOUR USING SELF-ORGANIZING MAPS

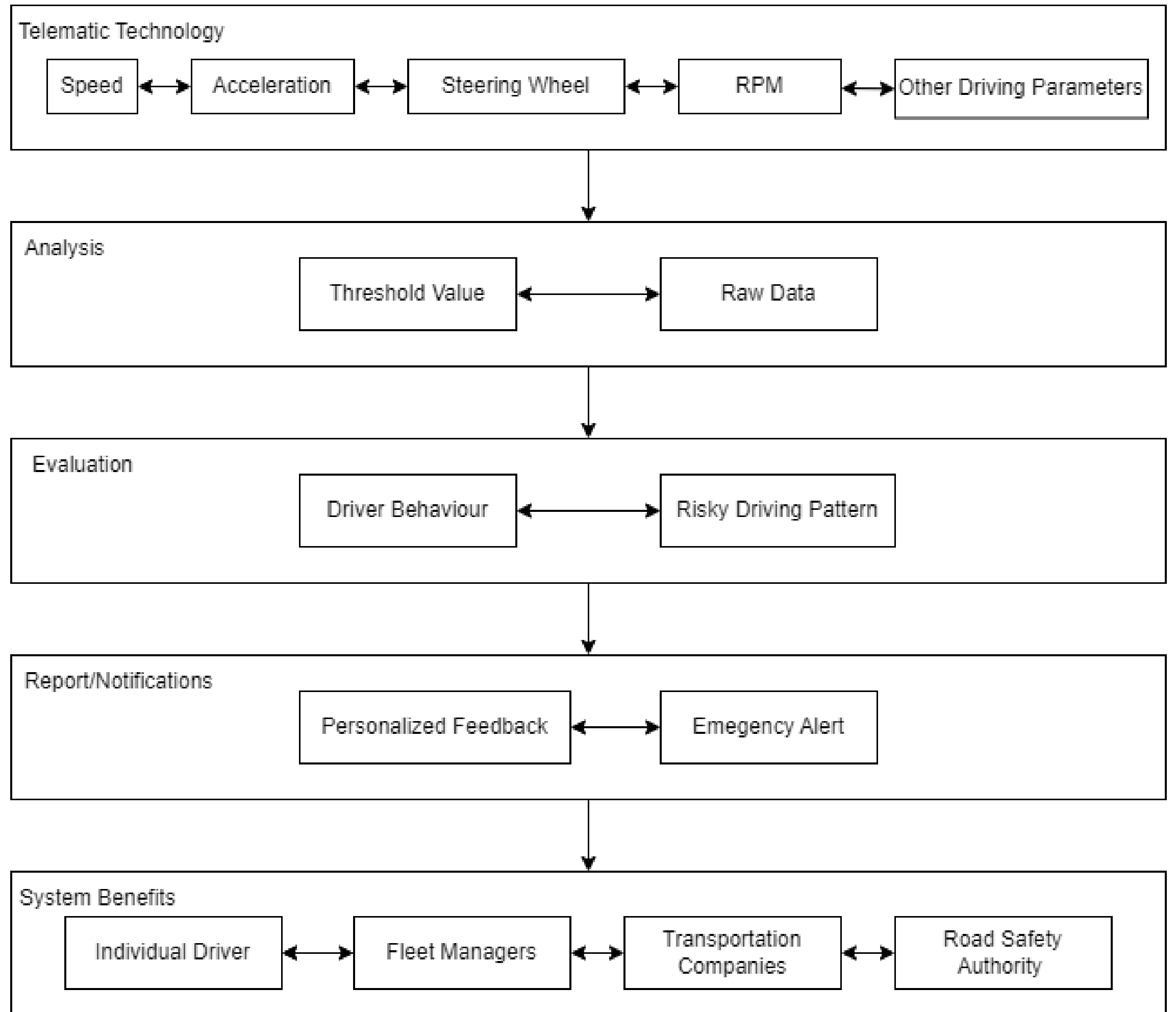
Author name: Matthew Immanuel Samson , David A. Calvert ,Lana M. Trick

Journal Name: IEEE

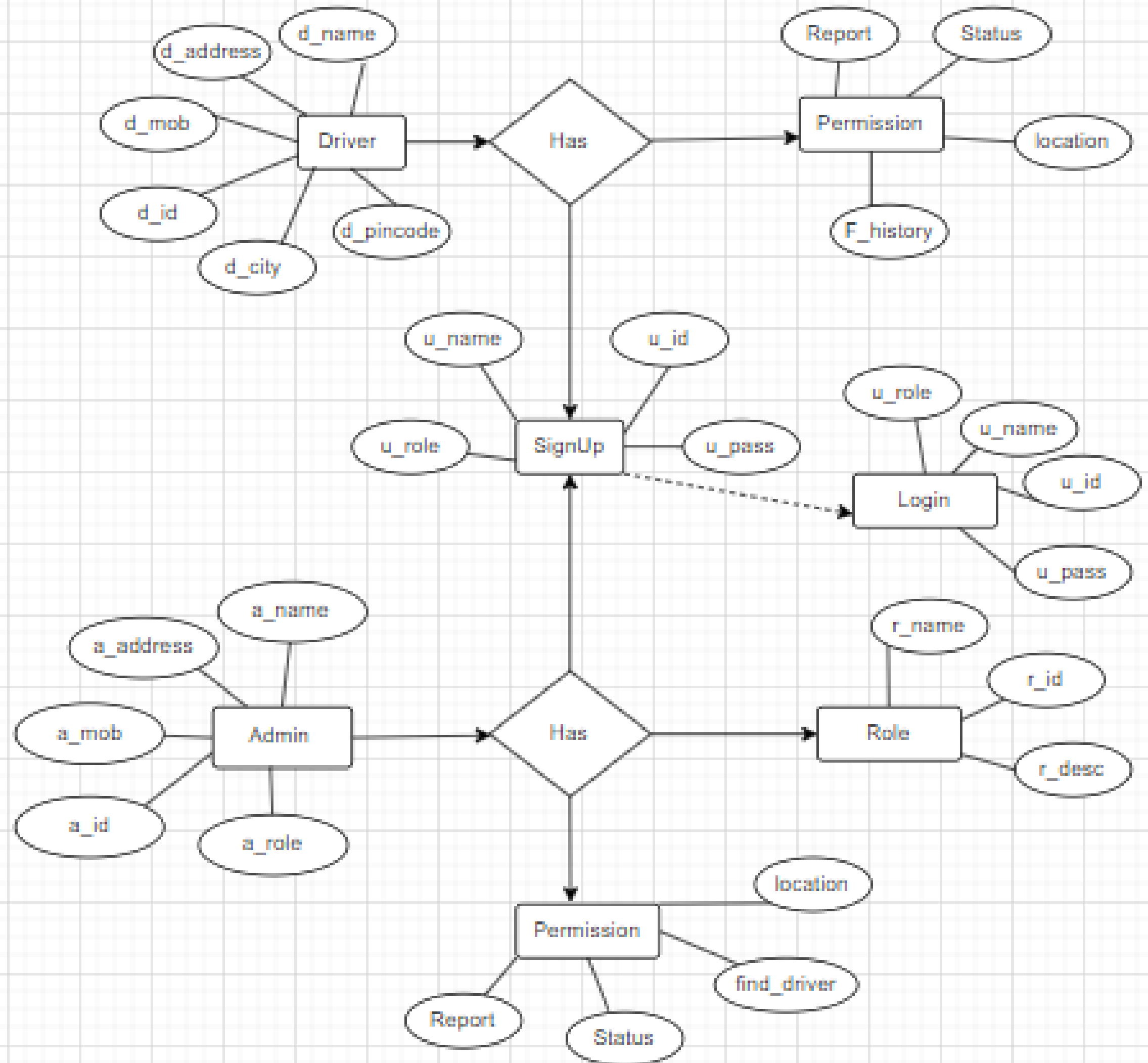
Year of publishing:2021

- The collected data, that was used for analyzing the driver's behaviour, included application of the brake(brake pressure) , velocity in three dimensions (X,Y,Z) , turning, lane gap, and above average velocity.
- These patterns are used to build a model for the behaviour of driver using the Self Organizing Maps (SOM). Each driver was subjected to three types of distraction which were music, hands-free verbal communication, and texting.
- For analyzing driver's behaviour the SOM is trained with all the 40 participants in the study and with the three types of distraction.

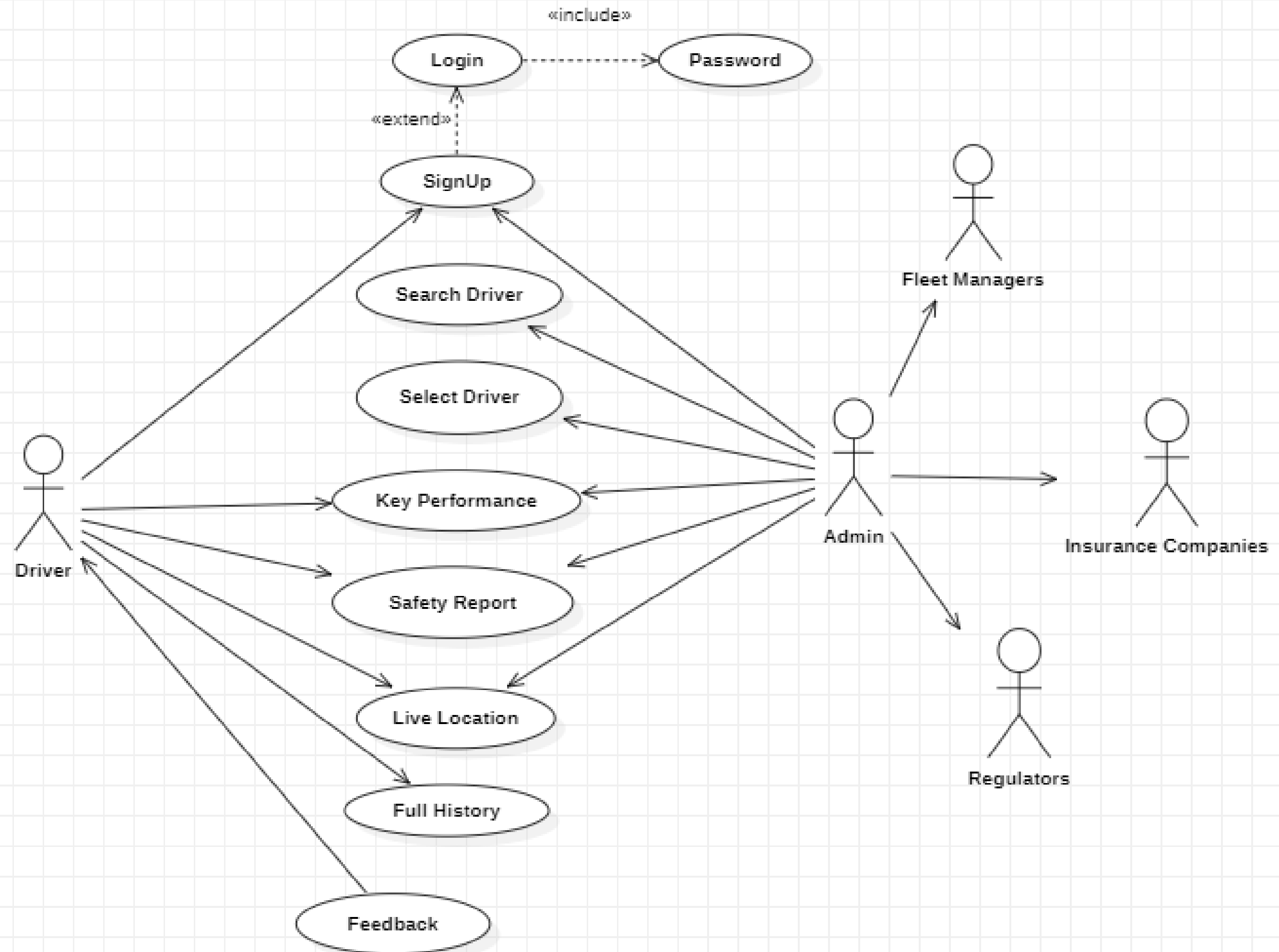
PROCESS FLOW DIAGRAM



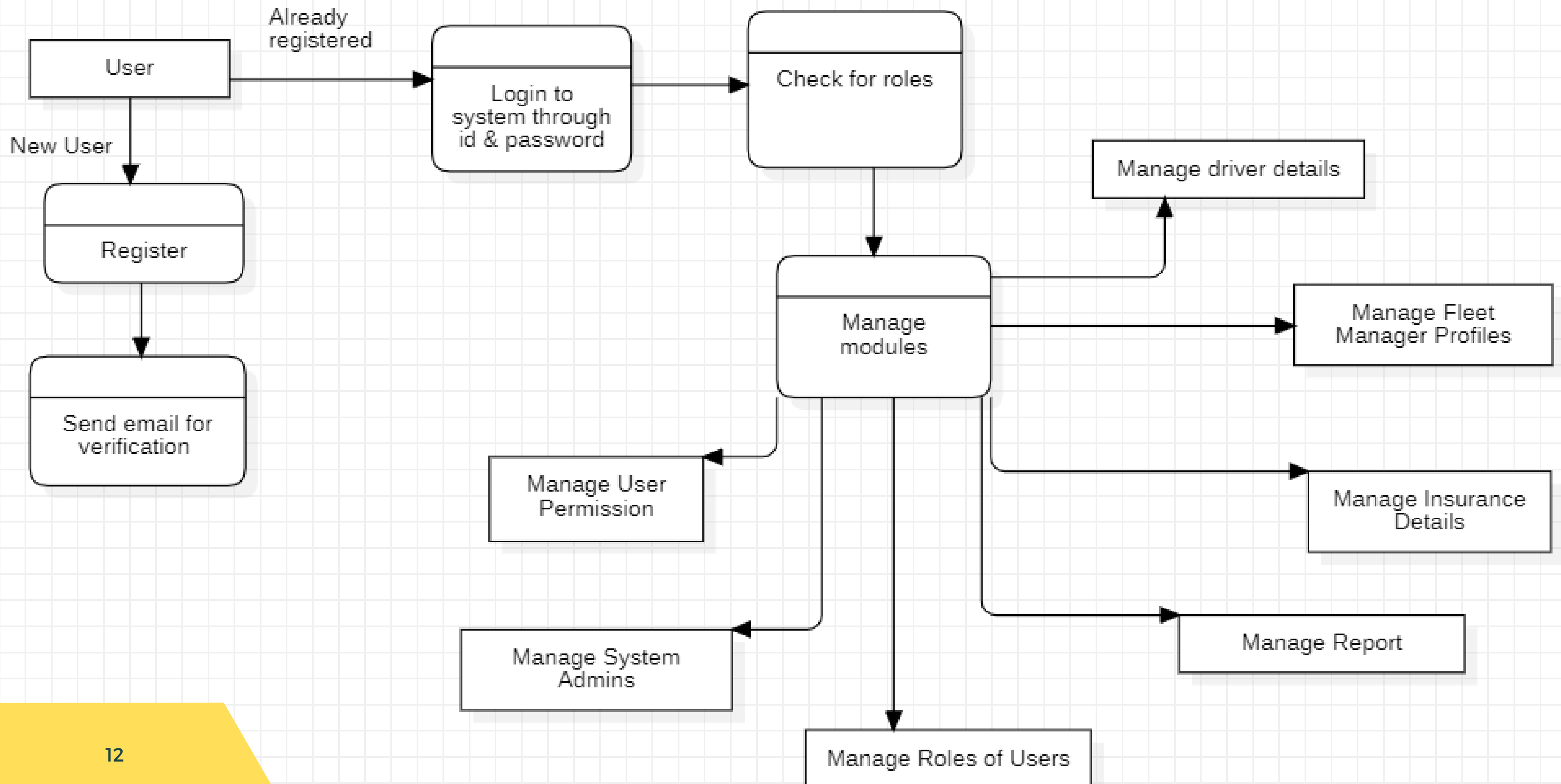
ENTITY RELATIONSHIP DIAGRAM

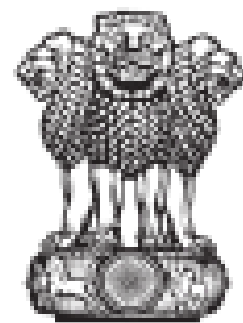


USE CASE DIAGRAM



DATA FLOW DIAGRAM





सत्यमेव जयते

G.A.R.6
[See Rule 22(1)]
RECEIPT



Controller General of Patents, Designs & Trade Marks

Docket No 100352

Date/Time 2023/08/26 15:30:29

To
VIKAS KAMRA

UserId: kamra1984

House No. 3, Behind Govt. School, Chawla
Colony, Khairpur, Hisar Road, Sirsa,
Haryana - 125055.

CBR Detail:

Sr. No.	App. Number	Ref. No./Application No.	Amount Paid	C.B.R. No.	Form Name	Remarks
1	202311057301	TEMP/E-1/66605/2023-DEL.	1600	38641	FORM 1	ANALYSIS OF A VEHICLE DRIVER FOR ACCESSING THEIR DRIVING PERFORMANCE AND ENHANCING ROAD SAFETY
2	E-12/6022/2023/DEL.	202311057301	2500	38641	FORM 9	----

TransactionID	Payment Mode	Challan Identification Number	Amount Paid	Head of A/C No
N-0001206749	Online Bank Transfer	2608230017725	4100.00	1475001020000001

Total Amount : ₹ 4100.00

Amount in Words: Rupees Four Thousand One Hundred Only

Received from VIKAS KAMRA the sum of ₹ 4100.00 on account of Payment of fee for above mentioned Application/Forms.

* This is a computer generated receipt, hence no signature required.

PATENT STATUS

Patent has been successfully published.

Here's is the link of screenshot of published patent.
[ClickHere!](#)

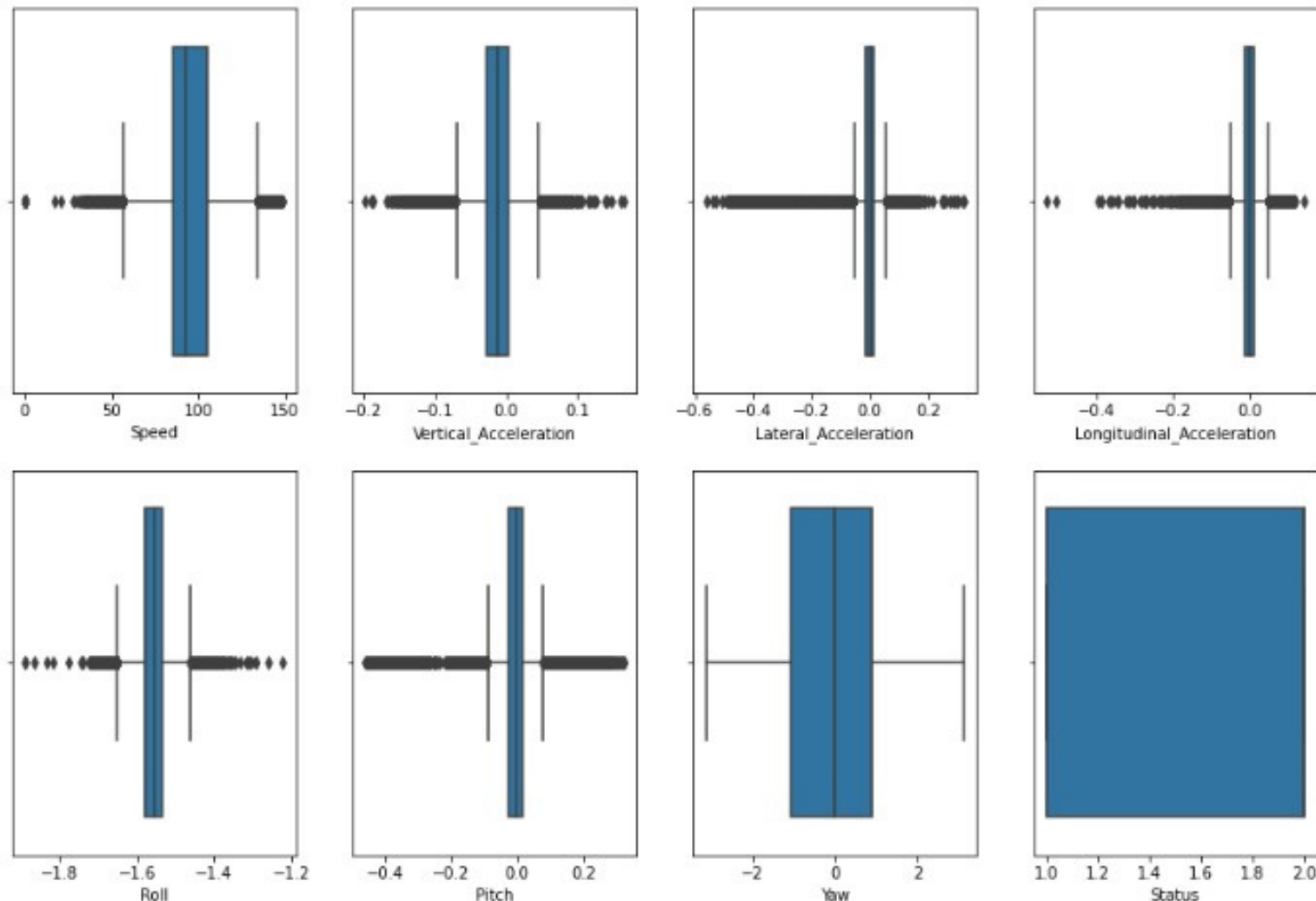
RESEARCH PAPER STATUS

- 95% work done.
- Abstract has been submitted to mentor for submission in conferences.

PROJECT STATUS

- 85% work done.
- Working on improving the efficiency of project.

```
In [20]: plt.figure(figsize=(15,10))
for i,j in enumerate(df.columns):
    plt.subplot(2,4,i+1)
    sns.boxplot(x=df[j])
```



```
In [16]: #Added ignore_index to correct the indexing
df = pd.concat([df_train,df_test], axis=0, ignore_index=True)
```

```
In [17]: df
```

```
Out[17]:
```

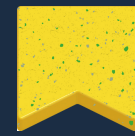
	Speed	Vertical_Acceleration	Lateral_Acceleration	Longitudinal_Acceleration	Roll	Pitch	Yaw	Status
0	130.1	-0.007	-0.006	-0.016	-1.576	-0.071	-2.981	2
1	90.7	-0.022	0.001	0.011	-1.520	-0.011	0.561	2
2	90.1	-0.001	-0.007	-0.027	-1.527	-0.034	1.834	1
3	140.1	0.017	-0.019	0.018	-1.576	0.018	-2.444	2
4	89.4	0.000	-0.011	-0.010	-1.602	0.012	-1.249	1
...
26435	80.6	-0.031	-0.009	-0.014	-1.537	-0.024	0.909	2
26436	87.6	-0.013	0.035	0.008	-1.641	-0.014	0.494	1
26437	83.7	-0.096	-0.035	-0.023	-1.602	-0.055	2.523	1
26438	92.6	-0.020	0.003	-0.001	-1.544	-0.043	0.928	2
26439	136.5	-0.099	-0.006	-0.029	-1.541	-0.039	0.243	2

26440 rows x 8 columns

TESTING REPORT

Here's the link of testing report:

[Click Here!](#)



REFERENCES

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- Sivaramakrishnan R Guruvayur and Dr. Suchithra R, “A Detailed Study on Machine Learning Techniques for Data Mining” IEEE International Conference on Trends in Electronics and Informatics, 11–12 May 2017, IEEE Xplore – 22 February 2018, pp. 1187–1192.
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THANK YOU!