GUJARAT TECHNOLOGICAL UNIVERSITY

(GTU)

INNOVATION COUNCIL (GIC)

Patent Search & Analysis Report

(PSAR)

Date of Submission : 19/10/2020

Dear **Panchal Shrey Rajeshbhai,**

Studied Patent Number for generation of PSAR	:	**20BE7_170130107057_3**

PART 1: PATENT SEARCH DATABASE USED

1. Patent Search Database used	:	Google Patents
Web link of database	:	https://patents.google.com/
2. Keywords Used for Search	:	reinforcement,traffic light,management
3. Search String Used	:	reinforcement learning for traffic lights management
4. Number of Results/Hits getting	:	30

PART 2: BASIC DATA OF PATENTED INVENTION /BIBLIOGRAPHIC DATA

5. Category/ Field of Invention	:	
6. Invention is Related to/Class of Invention	:	U.S Application data
6 (a) : IPC class of the studied patent	:	GSGI/07
7. Title of Invention	:	DECENTRALISED AUTONOMIC SYSTEM AND METHOD FOR USE IN AN URBAN TRAFFIC CONTROL ENVIRONMENT
8. Patent No.	:	US 2013/0176146A1
9. Application Number	:	13/703,774
9 (a) : Web link of the studied patent	:	https://patents.google.com/patent/US20130176146?oq=reinforcement+learning+for+traffic+lights+management
10. Date of Filing/Application (DD/MM/YYYY)	:	Jun. 15, 2011
11. Priority Date (DD/MM/YYYY)	:	
12. Publication/Journal Number	:	
13. Publication Date (DD/MM/YYYY)	:	
14. First Filled Country : Albania	:	284

15. Also Published as

Sr.No	Country Where Filled	Application No./Patent No.
1	United States	US 2013/0176146A1

16. Inventor/s Details.

Sr.No	Name of Inventor	Address/City/Country of Inventor
1	Ivana Dusparic	Dublin (IE)
2	Vincent Cahill	Dublin (IE)

17. Applicant/Assignee Details.

Sr.No	Name of Applicant/Assignee	Address/City/Country of Applicant
1	THE COLLEGE OF THE HOLY UNOVIDED TRINITY OF QUEE	Dublin (IE)

18. Applicant for Patent is : College

PART 3: TECHNICAL PART OF PATENTED INVENTION

19. Limitation of Prior Technology / Art

The system as claimed in claim 1 wherein the exchanged values to learn preferences of policies implemented by other agents comprise means for using remote policy learning.

20. Specific Problem Solved / Objective of Invention

The invention relates to the field of decentralized autonomic systems, and specifically to urban traffic control systems.

21. Brief about Invention

The invention provides a fully self-organizing Urban Traffic Control (UTC) system that uses reinforcement learning (RL) to map the currently-observed traffic condi tions (based on the information received from the available road and/or in-car sensor technology) to appropriate traffic light sequences. Sucha UTC system is enabled through use of a novel multi-policy multi-agent optimization algorithm, Dis tributed W-Learning (DWL), which is using RL techniques Q-learning and W-learning, remote learning, and cooperation coefficient learning.

22. Key learning Points

How reinforcement works and also about the decentralized autonomic system.

23. Summary of Invention

According to the present invention there is provided, as set out in the appended claims, a system of agents for use in an Urban Traffic Control environment, each agent repre senting a traffic light controller at a traffic junction to control traffic flow, said system comprising:
0017 each agent is adapted to collect data local to the junction using one or more sensors and applying a Q-learning reinforcement learning model to said col lected data, one Q-learning model per each policy that the agent is implementing.

24. Number of Claims : 14

25. Patent Status : Expired Patent

26. How much this invention is related with your IDP/UDP?

71 to 90%

27. Do you have any idea to do anything around the said invention to improve it? (Give short note in not more than 500 words)

We can improve the machine learning model and also we can improve the algorithm used for traffic management.