



**GUJARAT TECHNOLOGICAL UNIVERSITY
(GTU)
INNOVATION COUNCIL (GIC)
Patent Search & Analysis Report
(PSAR)**



Date of Submission :

Dear **DAVE SANKET GOPALBHAI,**

Studied Patent Number for generation of PSAR :

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 | : | Human, activity, recognition, Camera, Supicious, Pose |
| 3. Search String Used | : | OBJECT DETECTION USING DEEP NEURAL NETWORKS |
| 4. Number of Results/Hits getting | : | 9999 |

PART 2: BASIC DATA OF PATENTED INVENTION /BIBLIOGRAPHIC DATA

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|--|---|---|
| 5. Category/ Field of Invention | : | USPC.....382/159,253,224,228 |
| 6. Invention is Related to/Class of Invention | : | Continuation of application No. 1 1/412.252 |
| 6 (a) : IPC class of the studied patent | : | G06K 9/66 |
| 7. Title of Invention | : | OBJECT DETECTION USING DEEP NEURAL NETWORKS |
| 8. Patent No. | : | EP 3 289 430 B1 |
| 9. Application Number | : | 14/288,194 |
| 9 (a) : Web link of the studied patent | : | https://patentimages.storage.googleapis.com/43/0a/29/d2ad91302c9837/EP3289430B1.pdf |
| 10. Date of Filing/Application (DD/MM/YYYY) | : | 05/27/2014 |
| 11. Priority Date (DD/MM/YYYY) | : | |
| 12. Publication/Journal Number | : | |
| 13. Publication Date (DD/MM/YYYY) | : | |
| 14. First Filled Country : | : | |

15. Also Published as

Sr.No	Country Where Filled	Application No./Patent No.
1		

16. Inventor/s Details.

Sr.No	Name of Inventor	Address/City/Country of Inventor
1	Christian Szegedy	Sunnyvale
2	Dumitru Erhan	CA CPC(US);

17. Applicant/Assignee Details.

Sr.No	Name of Applicant/Assignee	Address/City/Country of Applicant
1	Google Inc.	Mountain View, CA (US)

18. Applicant for Patent is : Company

PART 3: TECHNICAL PART OF PATENTED INVENTION**19. Limitation of Prior Technology / Art**

If the object is not fitted into the bounded box the the detector is unable to detect the image..

20. Specific Problem Solved / Objective of Invention

Human activity and facial expression modeling and recognition are based on feature extraction techniques from time sequential images.

21. Brief about Invention

Methods, systems, and apparatus, including computer programs encoded on computer storage media, for detecting objects in images. One of the methods includes receiving an input image. A full object mask is generated by providing the input image to a first deep neural network object detector that produces a full object mask for an object of a particular object type depicted in the input image. A partial object mask is generated by providing the input image to a second deep neural network object detector that produces a partial object mask for a portion of the object of the particular object type depicted in the input image..

22. Key learning Points

Deep neural networks, mask generation engine , DNN object detectors.

23. Summary of Invention

This specification describes how a system can use deep neural networks to detect objects in images. In particular, the system can use deep neural networks that generate, for an input image and a particular object type, full and partial object masks that defines regions in the image that include the object. Multiple candidate bounding boxes can be generated and ranked based on their correspondence to the full and partial object masks generated by the deep neural networks. The bounding boxes can be generated and refined at multiple scales and aspect ratios and for multiple object types..

24. Number of Claims : 20

25. Patent Status : Expired Patent

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

50 to 70%

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)

In general, one innovative aspect of the subject matter described in this specification can be embodied in methods that include the actions of receiving an input image; generating a full object mask by providing the input image to a first deep neural network object detector..