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Analysing and Improving Efficiency of Production in Manufacturing Industries Using Artificial Intelligence Methodology with Real Time Implementation

Suriya S¹, Vignesh Kumar E S², Vishal Sekar R C³, M A Seshiah ⁴

U.G. Student, Department of Electronics and Communication Engineering, Meenakshi Sundararajan Engineering College, Chennai, Tamilnadu, India¹

U.G. Student, Department of Electronics and Communication Engineering, Meenakshi Sundararajan Engineering College, Chennai, Tamilnadu, India²

U.G. Student, Department of Electronics and Communication Engineering, Meenakshi Sundararajan Engineering

College, Chennai, Tamilnadu, India³

Associate Professor, Department of Electronics and Communication Engineering, Meenakshi Sundararajan

Engineering College, Chennai, Chennai, India⁴

ABSTRACT: India has been in a race for the past two and a half centuries but unfortunately it has been a race to the bottom. Most people think that the manufacturing industry is like the services or the Agri-industry; each industry having its own relative advantages and features. And one of the major criteria to consider is the manufacturing the goods and delivering it at proper lead time. To achieve the tracking of goods production and it's ontime delivery is required to be taken care. For that technology needs to be integrated with the manufacturing leading to its tremendous improvement. In this project we propose a system to automatically track and trace each step of manufacturing and the time taken incompletion of each step. If the threshold time limit exceeds for any step in the process, then an automatic mail will be sent to the manufacturer to automatically take steps for the process to complete on time. This is achieved by implementing object tracking methodology in industries.

KEYWORDS: Manufacturing technique, object detection, configuration.

I. INTRODUCTION

A manufacturing technique is that the way a business will establish, but it's going to produce its product for its customers. The manufacturing technique requirements unit has been completed by operations personnel. Requirements of the facilities and processes and associated costs unit have been best-known to switch building production units in step with the requirements of volume, time, and safety. Production arising with and management could also be a planned technique that plans, manages, and controls the allocation of human resources, material, and machinery to achieve the most efficiency. Loss of production speed is Associate in Nursing's inescapable reality for technique manufacturers. Reduced production speeds show to consume 9-15% of available production capability in varied production contexts and build substantial costs for capital-intensive technique industries. Amongst the littlest quantity examined of the six Brobdingnagian efficiency losses measured within total productive maintenance, speed loss presents very important opportunities for potential efficiency enhancements in manufacturing firms. The proposed MLP based object following system is made sturdy by Associate in Nursing optimum selection of distinctive choices and in addition by implementing the Ad boost strong classification methodology.



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II. RELATED WORK

Multi-Stream Siamese and quicker Region-Based Neural Network for time period Object following by Lolo Liu et al. [1]. shows that Traffic scene perception (TSP) aims to extract correct time period on-road surroundings info, that involves 3 phases: detection of objects of interest, recognition of detected objects, and following of objects in motion. Since recognition and following typically consider the results from detection, the flexibility to observe objects of interest effectively plays an important role in TSP. during this paper, we have a tendency to specialize in 3 necessary categories of objects: traffic signs, cars, and cyclists. we have a tendency to propose to observe all the 3 necessary objects in a very single learning-based detection framework. The planned framework achieves competitive performance with progressive approaches on many benchmark knowledge sets.

The second paper referred was coming up withVis: a visible Analytics Approach to Production Planning in good Factories by Dong Sun et al.[2]. propose PlanningVis, a visible analytics system to support the exploration and comparison of production plans with 3 levels of details: an idea summary presenting the distinction between plans, a product read visualizing varied properties of individual merchandise, and a production detail read displaying the merchandise dependency and also the daily production details in connected factories. By group action Associate in Nursing automatic coming up with rule with interactive visual explorations, thirteen PlanningVis will facilitate the economical improvement of daily production coming up with likewise as support a fast response to unlooked-for incidents in producing. 2 case studies with real-world knowledge and thoroughly designed interviews with domain consultants demonstrate the effectiveness and usefulness of PlanningVis.

Object Detection in high-resolution Remote Sensing imagination supported Convolutional Neural Networks With appropriate Object Scale options by Peng Tang et al[3]. presents a unique HSRI object detection methodology supported convolutional neural networks (CNNs) with appropriate object scale options. First, the acceptable ROI scale of object detection is obtained by compilation statistics for the dimensions vary of objects in HSRIs. Then, a CNN framework for object detection in HSRIs is intended employing a appropriate ROI scale of object detection. the article options obtained employing a CNN have smart generality and lustiness. Finally, a CNN framework with an acceptable ROI scale of object detection is trained and tested. mistreatment the WHU-RSONE knowledge set, the 14 the planned methodology is compared with the quicker region-based CNN (Faster-RCNN) framework. The experimental results show that the planned methodology outperforms the Faster-RCNN framework and provides smart object detection leads to HSRIs.

The drawbacks were analyzed as that object re-identification is performed to boost the following performance, solely vehicle and pedestrian object following square measure done, Lack of multiple object following, and constituent wise object following isn't done, which can result in match following worth.

III. METHODOLOGY

The operating of the full model from the on top of diagram may be explained as follows. The dataset that's been nee ded for the project coaching is been collected from numerous sources that area unit then trained by a deep learning model. within the coaching method, the MobileNet formula is been enforced to extend the twenty one accuracies of prediction and are available up with good object detection. If necessary network surgery also will be performed wherever the mix of algorithms takes place to extend the accuracy. A camera are enforced for the intelligence of watching the assembly unit. The camera is initialized and also the trained model is loaded, the article detection is currently live, once the script is police investigation the article, associate object following formula has been enforced for pixel-wise object following, the brink worth with time watching has been set, it'll be unbroken on watching the object's movement, the article that is affected late to following work station are intimated mistreatment associate email integration. By this project the work state at the producing trade is effectively monitored, reducing the burden on the management.



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Fig.1. Design architecture

Modules Description:

I : Dataset Collection: Given a rough set of two-dimensional figure points around associate object, will generate the constituent labels for segmentation. The deep extreme cut is additionally quite similar except they use solely the four extreme points round the object. this may then provide some nice bounding boxes and segmentation labels. an alternative choice is to use existing image annotation GUIs.

II : Training model with algorithm: Object discoverion because the term suggests is that the procedure to detect objects within the globe. during this method, we are able to discover the presence of any still object with abundant ease. The SSD design may be a single convolution network that learns to predict bounding box locations and classify these locations in one pass. Hence, SSD will be trained end-to-end.

III : Object detection : Multi-scale detection of objects was to be done by taking those objects into thought that had "different sizes" and "different side ratios". This was one among the most technical challenges in object detection within the early phases. But, after 2014, with the rise in technical advancements, the matter was resolved. This brought USA to the second part of object detection, wherever the tasks were accomplished victimization deep learning.



Fig 2: Object Detection



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IV : Object tracking : Technically, object chase starts with object detection identifying objects in a picture and assignment them bounding boxes. the article chase algorithm assigns associate ID to every object known within the image, and in future frames attempt to carry across this ID and establish the new position of constant object.



Fig 3 : Object tracking

V : E-mail Integration : For integration E-mail, the SMTP protocol {is USAed|is employed} for causing and receiving mail as designed by us.



VI: SMS integration : Twilio a 3rd half SMS agent is employed for causing SMS to the registered range if the digital computer time exceeds.



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IV. EXPERIMENTAL RESULTS

In this project, the Microsoft Visual Studio is used as an IDE and python as programming language.



(e)

Fig. 5. Results (a) data augmentation (b) Labelling the dataset (c) Configuration allotted time (d) Video frame setup for object detection (e) Configuration working time

V. CONCLUSION

This project is successfully implemented for effective monitoring of work states in the manufacturing sector using the artificial intelligence approach. We've also studied with the scenarios for workstations exceeding the alloted time. This project is very helpful in reducing the burden on the management of constant monitoring and also any possibility in human error is removed.

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