Increase Productivity In the Industry Using Wearable Devices and Artificial Intelligence

Shafkat Waheed
School of Electrical and
Computer Engineering
North South University
Email: *shafkat.waheed@gmail.com*

Muhammad Raihan
School of Electrical and
Computer Engineering
North South University
Email: *Muhammad.Raihan@northsouth.edu*

Mohammad Ashrafuzzaman Khan
School of Electrical and
Computer Engineering
Telephone: (800) 555–1212
Fax: (888) 555–1212

Abstract—**This paper proposes a general approach to increase the productivity in day to day work flow of the people who are engaged in monotonous task in the industry.This papers explores various deep learning techniques like convolutional neural network and Wavelet Analysis to extract information from wearable devices such as eSensor and Camera.This paper further explores how to give meaningful feedback using Recurrent Neural Network to maximize worker productivity through out the day, Some feedback like worker schedule,stress level and the method of working is suggested in this paper that would increases the total work flow in the industry.**

1. Introduction

Since the invention of wearable devices, more and more wearable devices are being used to solve day to day problems [?].The the future is IOT devices and providing smart solution through it.IOT devices are being applied in home monitoring, health monitoring and improving human experiences intensively[?]. These small devices of broad spectrum are changing the way one interacts forever[?].

Human beings are only able to make decision and optimize their day to day activities using the six sense they posses[?].IOT devices allowed us to go beyond our five senses, this added dimensionality really changed the way one makes decision.These devices worked as a catalyst to provide more information than what one could collect using their biological senses, these information with the help of machine learning and A.I enabled drastic optimization on every sector that feeds on data.Wearable devices like fitbit, smart watch are changing the whole scenario of data harvesting and decision making [?]. The world is changing, due to small optimization provided by these IOT devices and A.I. Therefore understanding the application of such devices has opened new doors of research.

Manufacturing industry is no stranger to Iot devices and A.I[?].Germany was the first to understand the potential of optimizing manufacturing process using IOT devices and Artificial Intelligence[?].They were able to change the whole scene of manufacturing with the integration of small devices in everyday production.Sensors like accelerome-ter,gyroscope,heat detector,light detector and vibration detector increased the dimension of standard information one could garner or gather[?]. Information of such volume crafted the way for machine learning and A.I to effectively optimize the work flow, industrial production and efficiency.

In this paper we tried to use data collected from wearable device like eSensor and camera to understand the work flow of labours in an environment, while improving labours working efficiency by smart scheduling, work placement and stress detection using Artificial Intelligence.

shafkat waheed
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2. Related Works

So far wearable devices can be like a watch,spectacles or headphones but to collect data of head and mouth related activities a small device on ear can be used that contains various sensor like accelerometer and gyrocope.eSensor is designed to collect such data.Three aspects helped the design decision: the physical dimension of the eSense printed circuit board to maintain the aesthetics and comfort, the minimization of signal interference from adjacent sensors, and the maximization of battery life to offer the primary functional service[?].eSense can be effectively used to monitor head- and mouth-related behavioral activities including speaking, eating, drinking, shaking, and nodding, as well as a set of whole-body movements. Moreover, with eSense conversational activity monitoring capabilities, social interactions can be quantified that to further help treat different mental health conditions and provide well-being feedback[?].

The data collected through this device is raw and needs to be processed for information extraction.Many work has been done in the process of data extraction, previously raw data used to be processed and meaningful features was determined using statistical means but as the data become more and more complex new techniques in the field of A.I was developed for feature extraction.Some of this techniques falls in the subfield of A.I that is machine learning.Convolutional neural network and wavelet analysis are two complex system techniques used for extracting features

from data[??].It is possible to extract features from image using CNN to learn about the image and what it means[?]. Whereas wavelet analysis is used to extract features using mother wavelet[?].This two techniques are at the forefront of industry in the case image processing and signal analysis[?].

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3. Conclusion

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Acknowledgments

References

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