Automation in Civil Sector Using AI and Python Language

Akshay Vishwase[1], Ankit Bangale[2], Gauri Pawar[3], Priyanka Patil[4]

[1, 2, 3] UG Students Department of civil Engineering, G.H. Raisoni College of Engineering and Technology, Wagholi, Pune, Maharashtra, India.

[4] Professor, Department of Civil Engineering, G.H. Raisoni College of Engineering and Technology, Wagholi, Pune, Maharashtra, India.

Abstract - Construction industry is increasing rapidly, hence become highly competitive and faces challenges in the areas of costing like material cost, wages, machinery cost, etc., area of management like management of activities, labor, materials, flow of money, etc., labor workability and efficiency, safety of labor, management of time and maintaining the efficiency of workers, etc. these are complicated to deal for best outcomes. The aim of this paper is to create a system having an Artificial Intelligence (AI) coded with the help of Python Language to deal with these challenges. Based on the study of 26 review papers (national and international papers) and current available techniques at the site is to provide the AI in the mobile machineries (loaders, trucks, etc.) and cranes to perform respected activity at the construction site automatically or with the help of commands which are given from wireless devices like mobile/PC. The paper also suggests a device for labor which can be used to monitor them for the various safety reasons, for management of activities, for labor wages, etc. are mentioned in this paper.

Keywords: Artificial Intelligence (AI), Python Language.

I. INTRODUCTION

In today's world AI covers every automation part because it is a system to understand intelligent entities construct them in proper ways and help to make process of decision making simple, efficient and quick. In today's engineering technique AI is used for human benefit and convenience because of AI, human can do any work in a proper manner and finish it in their time limit with minimum errors.

In simple ways AI is the technology with automation of intelligent behavior that acts and thinks like human beings. AI is technology in which humans replace in mechanical industries, electrical industries and many other types of industries. AI helps in collection of data and analysis of data to improve safety management, construction management, risk analysis and time reduction.

Python is a programming-language with good interface, easy to understand and it is small core language with large standard library. Python has a wide scope in the civil engineering sector, it helps in structure analysis algorithm analysis, image processing, file management and data handling.

Python is used to make program for following features
   a. Path following program
   b. Speech recognition
   c. Location tracking etc.

A. LINE PATH FOLLOWING

Line path following means path or road following. Today this method is used in many industries to minimize the time, working efficiency and correct placing of objects. in the civil industries placing of material from one place to other place plays important role for a continues working construction site, not only materials, machineries are also moved to other place where they are needed, they will be moved on a path provided for them at construction site. these machineries will be provided with a mechanism controlled with a processor which will detect the correct path to follow, also this processor will control the starting and ending as per the order given to them through the devices to make machines run through this path provided.

B. SPEECH RECOGNITION

Speech recognition means understanding the words directed from someone to perform a task or to understand something. But the computers run on machine language this audios or speech are collected through mike and then transferred to the processor where it searches for the best match from its stored data of speech words or the audio. In today's world best example of speech recognition are Google, Siri, Cortana, etc. we are going to implement this in the machineries for understanding the speech of the operator for fast response, for emergency purposes, for the working commands.

In this project we using a mobile as a controller and a wireless bot (a small electrical model to demonstrate project) having built in Wi-Fi in microcontroller, in this the operator have to give audio commands on the mobile to run the bot. The bot we are designing will run on basic audio inputs like start, stop, left and right. as per the operator speak mentioned commands the mobile will recognize the audio command of the operator and will send it to microcontroller fit on the bot.

II.   PROBLEM STATEMENT

Now a day automation is very important part in any field or at any work, so it is necessary to create something new in the automation sector, we design a new approach in automation in civil work like construction work and in irrigation department, there are lots of problems faced in civil engineering sectors related with automation so by considering those problems our idea is to create a new system which will work very effectively, simple to operate, very accurate and fast in use, our device is not very only operated by computers but also it operated by using mobile and tablets.

- Resource (man power) availability on construction site decreases hence automation is need of today's construction work.
- Need smart supervision on construction site.
- Safety or proper safety planning is important parameter on site.

III.   WORKING PRINCIPLE

In this project our working principles are safe and fast transport of materials on construction site considering the surroundings, providing safety to people on site while working around these machineries and handling of the material with proper care so that wastage will reduce. This focuses on the performance of the construction activity in both- time management and handling of material, also this project can be used by the other sites too. So, to provide a proper coordination in between the machineries - workers- managers this will stop the loss of materials and save economy, and to provide the safety to the labor.

IV.   CONCLUSION

- This paper has given a review of successfully AI and Python based automation system, many work which take more time this type of work completed in given time period with less amount of errors. This system has great potential in improve current system.
- AI used to solve human problem as well as engineering problem it also helps users to improve their current working scenario.
- It also helps various problems related to civil construction or civil engineering are very complex in nature at that time it help to understand that type of problem. It plays good role in management constructing supervision and managing different work of civil sector.

V.   REFERENCES

1. Pengzhen Lu[1], Shengyong Chen[2], and Yujun Zheng[2], "*Artificial Intelligence in Civil Engineering*", Article ID 145974, 5 November 2012

2. Tayfun Dede, Murat Kankal, Ali Reza Vosoughi, Maksym Grzywinski and Moarcir Kripka, "*Artificial Intelligence Applications in Civil Engineering*", Article ID 8384523, 2 may 2019.

3. Fedor Klashanov[a] , "*Artificial Intelligence and Organizing Decision in Construction*", Procedia Engineering 165 (2016) 1016 - 1020.

4. Akshata Patil[1], Lata Patted[1], Mahesh Tenagi[1], Vaishnavi Jahagirdar[1], Madhuri Patil[1], and Rahul Gautam[2], "*Artificial Intelligence as a Tool in Civil Engineering – A Review*", e-ISSN:2278-0661,p-ISSN: 2278-8727, 2017.

5. Swati Ricke, B. K. Raghu Prasad, "*Response Spectrum Analysis of Tall Building using Python*", ISSN: 2278-01, Vol. 8, Issue 20th july 2007.