

AN IN-PIPELINE BLOCK DETECTION ROBOT USING LEAK VERIFICATION SYSTEM

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Abstract - The proposed concept in this paper is to replace the manual work in drainage cleaning by an automated system. Impurities in drainage water can be only like empty bottles, polythene bags, papers etc. These impurities present in drainage water can cause blockage in the drainage system. The drainage system can be cleaned time to time manually or such a system can be designed that will automatically throw out wastages and will keep the water clean. This project is designed to keep clean the drainage system and helps the smooth working of the system. This project automatically cleans the water in the drainage system each time any wastage appears and this form an efficient and easy way of cleaning the drainage system and preventing the blockage. We designed our project to use this in efficient way to control the robot disposal of wastages and with regular filtration of wastages substance are treated separately and monitor the disposal of frequent manner.

Key Words: Raspberry pi, Ultrasonic sensor, Camera, Robo setup

1. INTRODUCTION

In today's era automation plays a very important role in all industrial applications for the proper disposal of sewage from industries and household is still a challenging task. In India drainage systems are usually open which leads to disposal of solid waste and that causes blockage. Drains are used for the adequate disposal of waste and unfortunately sometimes there may be a threat to human life during the cleaning of blockage in the drains or it can cause serious health issues because of the pertaining problems like malaria, dengue, etc. In order to overcome this problem as well as to save human life we implement a design "Automatic Drainage Cleaning System". We designed our project in order to use it in an efficient way to control the disposal of waste along with regular filtration of drains, removal of solid waste in order to avoid blockage in drains to promote continuous flow of drainage water which ultimately reduces the threat to human life

1.1 Raspberry pi

By using robot setup we can remove the object from the pipeline and camera is used to detect whether the pipeline as some holes and cracks . The ultrasonic sensor is used to detect objects . All the components like camera, ultrasonic sensor and robot setup is connected to raspberry pi using the python commands

1.2 Robot setup

Robot setup is used to move inside the pipeline and remove the polythene bags and bootles inside the path with the help of an arm .It is able to move right, left ,up and down. It works according to the commands given by us.

2. Methodology

Here robot setup is doing the process of removing bags , it will carry ultrasonic sensor to detect object .

Ultrasonic Sensor:

In this project ultrasonic sensor is used for to identify the wastes in the pipe and by passing the waves and identify the wastes present in pipe.

Camera:

In this project camera is used for the purpose of monitoring in pipe line leak and block detection . This robot is operated through our comment with the help of wireless camera which gives both audio and video signals on the monitor . The disposal of wastages is captured from drainage with USB Camera and monitored on PC .

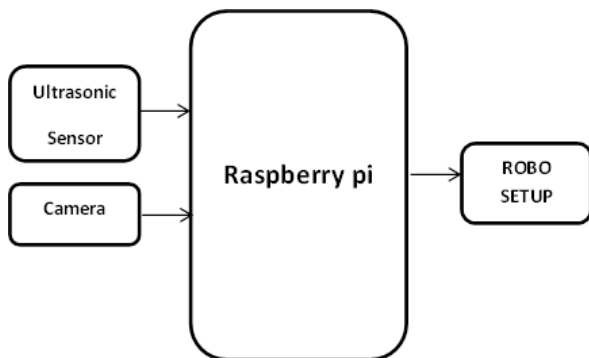


Fig -1: Block diagram

3. CONCLUSION

Thus the plastic bags are removed and leakage are detected very easily in pipeline as shown in the given block diagram .This method can be used in industries for many pipelines connection . The video recording is available for further references.

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REFERENCES

- [1] Shao, Lei, Yi Wang, BaozhuGuo, and Xiaoqi Chen, "A review over state of the art of in-pipe robot," in Mechatronics and Automation (ICMA), 2015 IEEE International Conference on, pp. 2180-2185. IEEE, 2015
- [2] Li, Zhao, Q. Z. Wang, Jin Li, Y. F. Liu, C. J. Liu, Lin Cao, and W. J. Zhang, "A new approach to classification of devices and its application to classification of in-pipe robots," in Industrial Electronics and Applications (ICIEA), 2016 IEEE 11th Conference on, pp. 1426-1431. IEEE, 2016.
- [3] Sibai, Fadi N., AmerSayegh, and Ihsan Al-Taie, "Design and construction of an in-pipe robot for inspection and maintenance," in Computer Systems and Industrial Informatics (ICCSII), 2012 International Conference on, pp. 1-6. IEEE, 2012.
- [4] Ismail, IszmirNazmi, AdzlyAnuar, KhairulSalleh Mohamed Sahari, MohdZafriBaharuddin, Muhammad Fairuz, Abd Jalal, and JunizaMdSaad, "Development of in-pipe inspection robot: A review," in Sustainable Utilization and Development in Engineering and Technology (STUDENT), 2012 IEEE Conference on, pp. 310-315. IEEE, 2012.
- [5] Kim, Ho Moon, Jung Seok Suh, Yun Seok Choi, Tran DucTrong, Hyungpil Moon, Jachoon Koo, SungmooRyew, and HyoukRyeol Choi, "An in-pipe robot with multi-axial differential gear mechanism," in Intelligent Robots and Systems (IROS), 2013 IEEE/RSJ International Conference on, pp. 252-257. IEEE, 2013.



Fig -2: Output

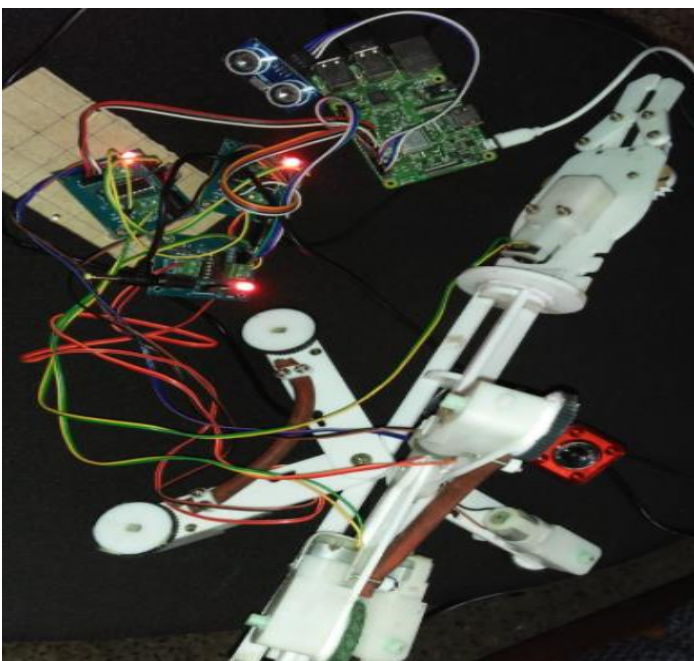


Fig -3: Hardware connection