Intelligent Detection and Elimination of Blockage in Pipe Using Robot Mechanism

K.Meera[1], R.Gayathri[2], N.Kokila[3], N.Lavanya[4], S.Jeya Anusuya[5]
[1, 2, 3, 4] Dept of Electronics and Communication Engineering
[5]Associate Professor, Dept of Electronics and Communication Engineering
[1, 2, 3, 4, 5] T.J.S Engineering College

Abstract- *This system presents arranging procedures for automated cleaning of stains on non-planar surfaces. Access to various bits of the stain may require visit repositioning and reorienting of the question. Around the globe, there are a large number of kilometers of high-pressure pipelines, a significant number of which are utilized to transport oil. By and large, conveyance of crude oil through pipelines is a standout amongst the most secure strategies. Notwithstanding, imperfections may happen and develop in the pipeline until the point that the pipeline cracks, with clear genuine outcomes. Accordingly, it requires that uncommon consideration be made to non-damaging testing of the pipeline, and specifically to splits that might be available, particularly to pressure consumption breaking. Right now, there are pipeline evaluation gadgets [called Pigs] accessible that utilization ultrasonic innovation to recognize pipeline divider breaks. This hardware is transported inside the pipeline by the streaming crude oil, while in the meantime ultrasound estimations are performed. This strategy can be utilized to survey up to several kilometers of pipeline in one run.*

Keywords- Cleaning, Non-Repetitive Tasks, Planning, Robotic Scheduled Cleaning Process.

I. INTRODUCTION

General public sewage framework in Viet-Nam works in no great conditions: sewage may spill out, potentially dirtying soil and ground water, and it might wash away soil, conceivably swarming the establishments of structures or the underground of boulevards and asphalts. Regularly wastewater contains different chemicals utilized as a part of current life. These incorporate substantial metals which are not biodegradable and may amass in stream dregs, plants, bugs, and fish. They begin from both mechanical and local sources and (over specific levels) can be lethal to creatures and people. In Viet-Nam, once in a while, the mechanical releases stream to sewers or householders constantly flush away poisonous everything or items they use to the sewage. Nearly of waste-water pipes in Viet Nam is non-man-sized tolerable sewages with a width under 80cm. Upkeep of thousands km of sewer requires their perpetual studying. This paper introduces the plan and created of wheeled, one connection vehicles for checking and cleaning works. The sewer robot is remote controlled by means of link.

These are for the most part studied by mounting a camera and a light either on a sled, which is dragged, or on a tractor, which is driven through the sewer, creating a video record of the pipe's condition. In the two cases ground administrators who control the vehicle utilize a link for direction and information procurement. The above procedure is both confounded and work escalated practically speaking. This is the fundamental inspiration of planning a robot that can travel self-rulingly through sewers. A few methodologies are made on the most proficient method to utilize a sewer video record to recuperate moment camera introduction and to survey sewer pipe distortions. The target of our paper is to investigate potential outcomes of a dynamic vision framework for, i.e. to explore how a sewer robot can utilize its camera to keep introduction inside a pipe while moving.

The work is a piece of a task went for building up a robot for self-sufficient sewer studying. The examination is concentrated upon run of the mill solid sewer. The robot, which is about half size of the sewer width, must have the capacity to adjust itself to the pipe hub. The main a convent data known is the geometrical state of the sewer (tube shaped, and so on.). This suggests a geometrical imperative on the condition the robot can anticipate.

II. RELATED WORKS

In the year of 2013, the authors "R. Bormann, F. Weisshardt, G. Arbeiter, and J. Fischer" proposed a paper titled "Autonomous dirt detection for cleaning in office environments", in that they described such as: the advances of advances for portable mechanical autonomy empower the utilization of robots to progressively complex errands. Cleaning office structures once a day is an issue that could be halfway automatized with a cleaning robot that helps the cleaning proficient yielding a higher cleaning limit. A common undertaking in this space is the specific cleaning, that is an engaged cleaning push to filthy spots, which accelerates

the general cleaning methodology altogether. To empower an automated cleaner to achieve this errand, it is first important to recognize filthy regions from the perfect leftover portion. This paper talks about a dream based soil discovery framework for versatile cleaning robots that can be connected to any surface and earth without past preparing, that is sufficiently quick to be executed on a portable robot and which accomplishes high soil acknowledgment rates of 90% at an adequate false positive rate of 45%. The paper additionally presents an extensive database of genuine scenes which was utilized for the assessment and is freely accessible.

In the year of 2011, the authors "F. Sato, T. Nishii, J. Takahashi, Y. Yoshida, M. Mitsuhashi, and D. Nenchev" proposed a paper titled "Experimental evaluation of a trajectory/force tracking controller for a humanoid robot cleaning a vertical surface", in that they described such as: the undertaking of cleaning a vertical level surface with the assistance of a standing humanoid robot is considered. A direction/constrain following controller is presented that is executed under a blended position/torque control mode. The arm joints are controlled with a regular PD controller working under position control, while the lower leg joints are torque controlled. The coveted power is acknowledged through a power following controller utilizing CoM and ZMP position readings got from the weight sensors in the feet. The direction/drive following controller is executed and tentatively assessed with a little humanoid robot HOAP-2.

In the year of 2010, the authors "C.-H. King, T. L. Chen, A. Jain, and C. C. Kemp" proposed a paper titled "Towards an assistive robot that autonomously performs bed baths for patient hygiene", in that they described such as: this framework depicts the plan and execution of a conduct that permits a robot with a consistent arm to perform wiping movements that are engaged with bed showers. A laser-based administrator choice interface empowers an administrator to choose a zone to clean, and the robot self-rulingly plays out a wiping movement utilizing balance point control. We assessed the execution of the framework by estimating the capacity of the robot to evacuate a zone of flotsam and jetsam on human skin. We tried the execution of the conduct calculation by instructing the robot to wipe off a 1-inch square territory of flotsam and jetsam put on the surface of the upper arm, lower arm, thigh, and shank of a human subject. Utilizing picture handling, we decided the tint substance of the flotsam and jetsam and utilized this portrayal to decide the level of garbage that stayed on the arm after the robot finished the errand. In our investigations, the robot expelled the vast majority of the garbage (>96%) on four sections of the appendages. Likewise, the robot played out the wiping undertaking utilizing moderately low power (<;3 N).

III. BLOCK DIAGRAM

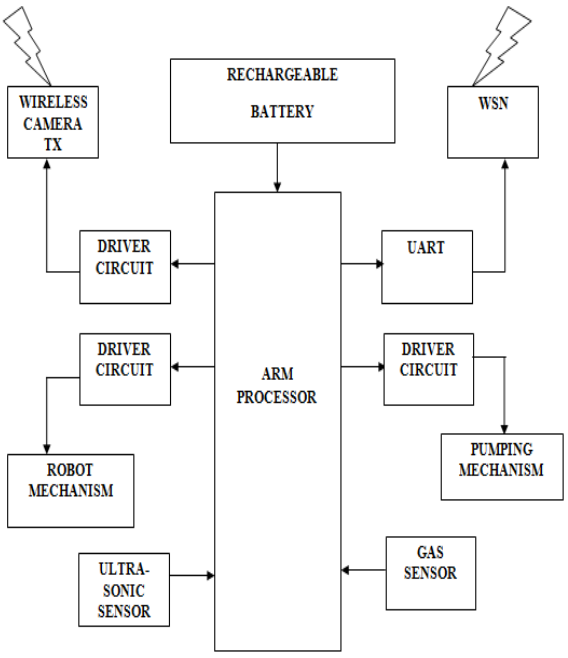

Fig.1 Proposed System Block Diagram

IV. BATTERY FUNCTIONING

To imagine how a battery functions, envision yourself putting antacid batteries, similar to twofold AAs, into an electric lamp. When you put those batteries into the spotlight and afterward turn it on, what you're truly doing is finishing a circuit. The put away concoction vitality in the battery proselytes to electrical vitality, which goes out of the battery and into the base of the spotlight's globule, making it illuminate. At that point, the electric current re-enters the battery, yet at the contrary end from where it turned out initially. The majority of the parts of the battery cooperate to make the spotlight illuminate. The cathodes in the battery contain molecules of certain directing materials.

For example, in a basic battery, the anode is normally made of zinc, and manganese dioxide goes about as the cathode. Also, the electrolyte between and inside those terminals contains particles. At the point when these particles get together with the anodes' iotas, certain electrochemical responses occur between the particles and the terminals' molecules. The arrangement of compound responses that happens in the anodes are by and large known as oxidation-lessening (redox) responses. In a battery, the cathode is known as the oxidizing specialist since it acknowledges electrons from the anode. The anode is known as the decreasing operator, since it loses electrons. At last, these responses result in the stream of particles between the anode and the cathode, and the liberating of electrons from the iotas of the terminal,

Sastry said. These free electrons gather inside the anode (the base, level piece of a soluble battery). Accordingly, the two terminals have diverse charges: The anode turns out to be contrarily charged as electrons are discharged, and the cathode turns out to be decidedly charged as electrons (which are adversely charged) are expended.

This distinction in control makes the electrons need to advance toward the emphatically charged cathode. Notwithstanding, they don't have an approach to arrive inside the battery in light of the fact that the separator keeps them from doing as such. When you flick the switch on your spotlight, every one of that progressions. The electrons now have a way to get to the cathode. However, to start with, they need to go through the base of your spotlight's knob. The circuit is finished when the electric current re-enters the battery through the highest point of the battery at the cathode.

V. ARM CONTROLLER

A wireless camera, related frill and specialized parameters. The 1 focal point light weight and little volume, measure: 15*15*15mm (now is the world's littlest CCD) shooting adaptable incognito .The 2.480 line communicate SONY-CCD chip, 120 degree wide edge 0.05LUX super low illumination. The 3 focal point can be flexible concentration, can take 2CM from the text.4 worked in proficient pickup, Home cctv camera all the more clear voice.5.500-800 m wireless microwave video transmission, transmit and get programmed bolting signal, the picture more stable.6 expansive limit lithium batteries, revived 800 times, little volume and no memory control supply for a long time. Wireless camera activity process.1 the primary focal point link get to hosts.2 open the fundamental switch. The 3 collector control box of 12V power supply yield connector to the beneficiary 12V power input gap.

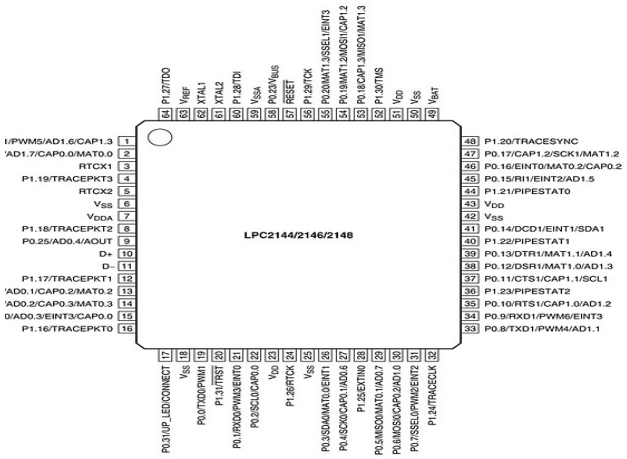

Fig.2 Pin Configuration

The 4 associating 12V lithium battery to the beneficiary info control box 12V.5 put the collector AV yield line is associated with the DV AV input port, and the accepting box arrangement DV focal point end DV machine to play. Wireless innovation is being connected to pretty much everything nowadays, and video observation takes great preferred standpoint of it. A wireless camera incorporates an implicit transmitter to send video over the air to a collector rather than through a wire.

Numerous individuals aren't mindful that there are different sorts of wireless innovation being used, each with one of a kind focal points and disadvantages. Most wireless cameras are in fact cordless gadgets, implying that however they transmit a radio flag, despite everything they should be connected to a power source. In any case, "wireless" is the regularly utilized industry term. A few cameras do have batteries, obviously, making them really wireless. Be that as it may, battery life is as yet an issue for proficient or even semi-proficient applications. These gadgets deal with a basic rule.
The camera contains a wireless radio (RF) transmitter. This transmitter communicates the camera's video, which can be grabbed by a collector, which will be associated with a screen or recording gadget. A few beneficiaries have worked away, while others must be associated with a DVR.

VI. PAST SYSTEM ANALYSIS

In existing system for the urban gas supply system require a robot possessing outstanding mobility and advanced control algorithms, since they are configured with various pipeline elements, such as straight pipelines, elbows, and branches. In this project, a comprehensive work for moving inside underground urban gas pipelines with a miniature differential-drive in-pipe robot, called the Multifunctional Robot for IN-pipe inspection has been developed for the inspection of urban gas pipelines with a nominal 4-in inside diameter.

VII. PROPOSED SYSTEM

In our proposed system we are implementing the robotic mechanism for detecting and eliminating the blockage in pipe line here we are using wireless camera for monitoring which is inbuilt with Arm Processor controlled with robotic mechanism so that robots can move to and fro over the pipe line.

Fig.3 System Setup

By using ultrasonic sensor we can find the distance between the robot & blocks in the pipe, along with that we can find the amount of gas present in the pipe with the help of gas sensor. The robot can operate with the help of user control given via Wireless sensor network i.e., WSN. In addition to that we are integrating pumping mechanism in order to remove the blockage inside the pipe line camera detects the blockage, this event is monitored by the user with wireless camera via WSN, also pumping mechanism activates by blowing force water were ever blocks inside the pipe.

VIII. CONCLUSION

We displayed procedures to mechanize robotic cleaning of bended surfaces with hard stains. The approach is pertinent to errands like cleaning and paint stripping. Inclusion of different repositioning and reorienting makes the strategy appropriate for viable cleaning assignments. We displayed heuristics that empower the calculation to give arrangements progressively. Semi-directed learning of ideal cleaning errand parameters rolls out the strategy powerful against improvement in surface and stain profile. Along these lines the venture improves the sewage framework and takes out the human association for clearing the sewage. The sensors utilized here builds the identification of impediment and nearness of Gas introduce inside the sewage framework. The framework gives automated setup systems which are fit for clearing the junk struck inside the openings. The usage of this framework may decrease the quantity of passing caused for human working in such parts.

REFERENCES

[1] M. Kabir et al., “Planning algorithms for multi-setup multi-pass robotic cleaning with oscillatory moving tools,” in Proc. IEEE Int. Conf. Autom. Sci. Eng. (CASE), Aug. 2016, pp. 751–757.

[2] R. Bormann, F. Weisshardt, G. Arbeiter, and J. Fischer, “Autonomous dirt detection for cleaning in office environments,” in Proc. IEEE Int. Conf. Robot. Autom. (ICRA), May 2013, pp. 1260–1267.

[3] F. Sato, T. Nishii, J. Takahashi, Y. Yoshida, M. Mitsuhashi, and D. Nenchev, “Experimental evaluation of a trajectory/force tracking controller for a humanoid robot cleaning a vertical surface,” in Proc. IEEE/RSJ Int. Conf. Intell. Robots Syst. (IROS), Sep. 2011, pp. 3179–3184.

[4] C.-H. King, T. L. Chen, A. Jain, and C. C. Kemp, “Towards an assistive robot that autonomously performs bed baths for patient hygiene,” in Proc. IEEE/RSJ Int. Conf. Intell. Robots Syst. (IROS), vol. 1, Oct. 2010, pp. 319–324.

[5] F. Nagata, T. Hase, Z. Haga, M. Omoto, and K. Watanabe, “CAD/CAM-based position/force controller for a mold polishing robot,” Mechatronics, vol. 17, nos. 4–5, pp. 207–216, May/Jun. 2007.

[6] D. J. Buckmaster, W. S. Newman, and S. D. Somes, “Compliant motion control for robust robotic surface finishing,” in Proc. 7th World Congr. Intell. Control Autom. (WCICA), Jun. 2008, pp. 559–564.

[7] J. Hess, G. D. Tipaldi, and W. Burgard, “Null space optimization for effective coverage of 3D surfaces using redundant manipulators,” in Proc. IEEE/RSJ Int. Conf. Intell. Robots Syst. (IROS), Oct. 2012, pp. 1923–1928.

[8] C. Eppner, J. Sturm, M. Bennewitz, C. Stachniss, and W. Burgard, “Imitation learning with generalized task descriptions,” in Proc. IEEE Int. Conf. Robot. Autom. (ICRA), May 2009, pp. 3968–3974.

[9] A. Gams, M. Do, A. Ude, T. Asfour, and R. Dillmann, “On-line periodic movement and force-profile learning for adaptation to new surfaces,” in Proc. 10th IEEE-RAS Int. Conf. Humanoid Robots (Humanoids), Dec. 2010, pp. 560–565.

[10] B. Nemec and A. Ude, “Action sequencing using dynamic movement primitives,” Robotica, vol. 30, pp. 837–846, Sep. 2012.

[11] D. Martínez, G. Alenyá, and C. Torras, “Planning robot manipulation to clean planar surfaces,” Eng. Appl. Artif. Intell., vol. 39, pp. 23–32, Mar. 2015.

[12] A. M. Kabir, J. D. Langsfeld, C. Zhuang, K. N. Kaipa, and S. K. Gupta, “Automated learning of operation

parameters for robotic cleaning by mechanical scrubbing," in Proc. ASME 11th Int. Manuf. Sci. Eng. Conf., Jun. 2016, p. V002T04A001.

[13] J. D. Langsfeld, A. M. Kabir, K. N. Kaipa, and S. K. Gupta, "Robotic bimanual cleaning of deformable objects with online learning of part and tool models," in Proc. IEEE Int. Conf. Autom. Sci. Eng. (CASE), Aug. 2016, pp. 626–632.

[14] J. D. Langsfeld, A. M. Kabir, K. N. Kaipa, and S. K. Gupta, "Online learning of part deformation models in robotic cleaning of compliant objects," in Proc. ASME 11th Int. Manuf. Sci. Eng. Conf., Jun. 2016, p. V002T04A003.

[15] W. X. Ng, H. K. Chan, W. K. Teo, and I. M. Chen, "Programming a robot for conformance grinding of complex shapes by capturing the tacit knowledge of a skilled operator," IEEE Trans. Autom. Sci. Eng., to be published, doi: 10.1109/TASE.2015.2474708.