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# Bucket Conveyer System

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**ABSTRACT:** Bucket conveyors are used in industries to lift materials into high containers or other conveyors. Bucket conveyors move materials through buckets. Conveyor buckets are made up of interlocking rings. My idea is to use robotic systems on a conveyor to perform certain tasks. Here I have designed a customer controllable conveyor using Arduino Uno, L298n motor driver and sensors. From this, the customer easily interacts with that conveyor system. This is a very welcome idea for an industry that connects customers directly.

**KEYWORDS:** Arduino Uno

## I. INTRODUCTION

Bucket conveyors are used in industries for lifting materials at heightened containers or other conveyors. Bucket conveyors move items (regularly total or mass) vertically through responding buckets. The conveyor is made of an interconnected loop of box/buckets that stay level while moving from horizontal to vertical, keeping their items from pouring out. The conveyor is loaded with material at the front, or “boot”, and each bucket naturally deposits toward the finish of the run, otherwise called the discharge. This interaction is a quick and programmed technique for vertical conveying, as similar buckets what get material are utilized to store it. The plan of these machines relies intensely upon the material being shipped as well as the desired height that it should travel, however they are solid and productive whenever made accurately. They perform best while moving dry, light, or powder material and are normally not used to move wet or slime like substances, as any buildup in the buckets will cause releasing issues.

## II. RELATED WORK

The concept of image inpainting was first introduced by Bertamio et al. [1]. The method was inspired by the real inpainting process of artists. The image smoothness information interpolated by the image Laplacian is propagated along the isophotes directions, which are estimated by the gradient of image rotated by 90 degrees. Exemplar Based method proposed by Criminisi et al. [2] used a best exemplar patch to propagate target patch including missing pixels. This technique uses an approach which combine structure propagation with texture synthesis and hence produced very good results. In [3], the authors decompose the image into sum of two functions and then reconstruct each function separately with structure and texture filling-in algorithms. Morphological technique is used to extract text from the images presented in [4]. In [5], the inpainting technique is combined with the techniques of finding text in images and a simple algorithm that links them. The technique is insensitive to noise, skew and text orientation. The authors in [6] have applied the CCL (connected component labelling) to detect the text and fast marching algorithm is used for Inpainting.

The work in this paper is divided in two stages. 1) Text- Detection 2) Inpainting. Text detection is done by applying morphological open-close and close-open filters and combines the images. Thereafter, gradient is applied to detect the edges followed by thresholding and morphological dilation, erosion operation. Then, connected component labelling is performed to label each object separately. Finally, the set of selection criteria is applied to filter out non text regions. After text detection, text inpainting is accomplished by using exemplar based Inpainting algorithm.

### III. METHODOLOGY

Designing and implementing a bucket conveyor system requires a systematic approach to ensure efficiency, reliability, and safety. Here's a methodology to guide you through the process:

Needs Assessment:

Identify the specific requirements and objectives of the conveyor system, including material type, flow rate, distance, elevation changes, and operating conditions.

System Design:

Determine the layout and configuration of the conveyor system based on the application requirements.

Select the appropriate type of conveyor (e.g., belt or chain) and bucket design suitable for the material to be transported. Calculate the capacity, speed, and power requirements of the conveyor system.

Consider factors such as material properties, environmental conditions, space constraints, and safety regulations during the design phase

### IV. EXPERIMENTAL RESULTS

Figures shows the results of text detection from an image and inpainting by using exemplar based Inpainting algorithm. Figs. 2, 3, 4 (a) shows the original image. (b) is the image obtained by applying first set of criteria. All objects whose area greater than 10000 and filled area greater than 8000 are eliminated and major axis lengths are in between 20 to 3000 are considered to be text. Still, some small non-text objects are detected.



Fig. 4 Text Detection and Inpainting (a) Original image (b) Image after applying first set of criteria (c) Image after applying second set of criteria (d) Image mask (e) Inpainted image using patch size 5 x 5 and search window size 81 x 81

To eliminate small objects, connected component labelling is applied to the resultant image.(c) represents text detection by applying second set of criteria which eliminates all the objects whose area is less than 300 and filled area is less than 500.

### V. CONCLUSION

Based on the analysis results, final conclusion is obtained. A bucket elevator is used to move the various bulk materials in upwards direction. Vertical elevators depend on centrifugal force so that materials will flow in to the discharge chute and runs at high speed. Bucket conveyors, also known as bucket elevators, are a type of conveyor system used to move materials vertically. They are made up of endless chains or belts with buckets attached. The buckets carry material until they are tipped to discharge it



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