| 1	**Title of the project:** ARECANUT GRADING MACHINE
2	**Name of the College and Department:**KVG COLLEGE OF ENGINEERING SULLIA DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
3	**Name of the students:**Mr.ASHWINI KUMAR S Mr.MOHAMMED PARVEZ Mr.SUJAN K K Ms. VASUNDHARA DEVI M **Name of the guide:** Dr. KUSUMADHARA S Email id:kusumadhara5@gmail.com Phone :9019761755
4	**Keywords:**Raspberry Pi, Stepper motor, Conveyer belt, Camera module.
5	**Introduction:** The arecanut is one of the major commercial crops in India. According to market price and uses, arecanut (White supari) is normally classified into one of the four categories *Rashi, Patora, Cheppugotu,* and *Karigotu*. An automated arecanut grading system is a need of the day due to scarcity of labors. This project aims to develop an automatic grading system for arecanuts by using image processing techniques. The image processing algorithms such as thresholding, canny edge detection algorithm and crack density estimation are used. The requirement of high speed processing at a low cost provokes the use of Raspberry PI for implementing image processing algorithms. The developed project achieved a high degree of classification accuracy and thereby reduce misclassification. It also reached a speed higher than manual classification which will be remarkable.
6	**Objectives:** Agriculture is main occupation in india. Arecanut is one of the main agriculture .there are different types of arecanut . The market rates are different for these types. Classifying arecanut into four grades after drying is a difficult process which needs skilled man power and lot of time. Hence there is a need to mechanize the classification process so as to reduce the burden on the grower. The proposed work uses an electromechanical system controlled by processor that segregates dried arecanuts based on its grade. This project aims to develop an automatic arecanut grading system by using image processing techniques. The image of the arecanuts is captured and processed. Based on the extracted features of arecanuts, they are classified. A mechanical seperator is used to segregate the arecanuts depending on the classification data.

| 7 | **Methodology:**

      This project aims to develop an automatic arecanut grading system by using image processing chniques. The requirement of high speed processing at a low cost provokes the use of Raspberry Pi for implementing image processing algorithms [2]. The project is intended to achieve a high degree of classification accuracy and thereby reduce misclassification. Fig 2.1 shows the block diagram of the system
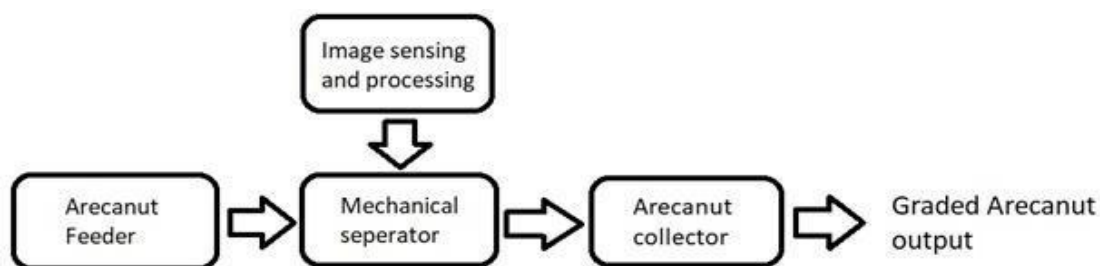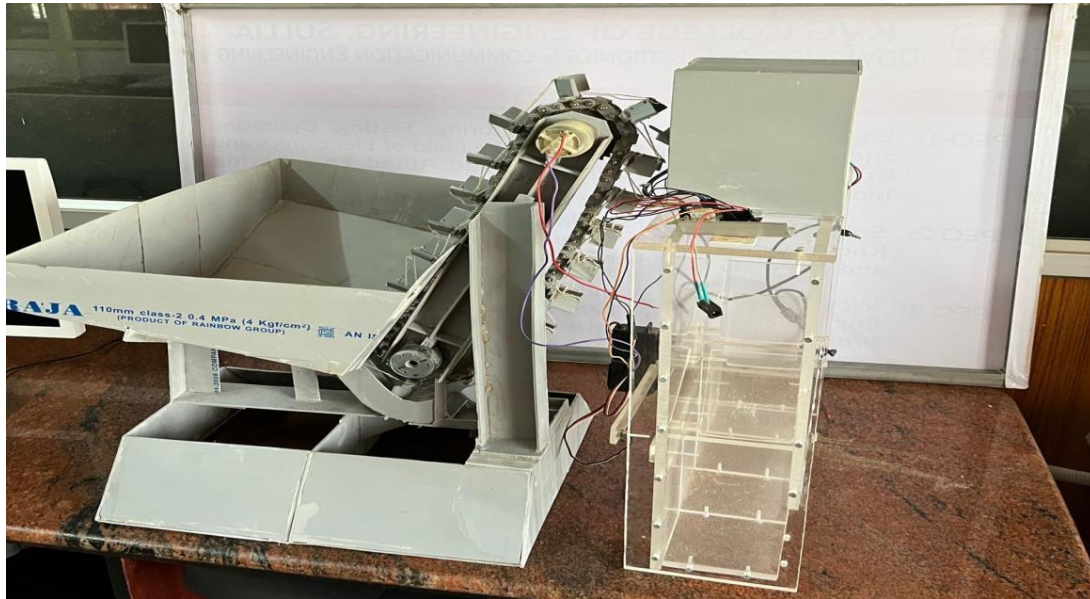

Fig 1: Block Diagram of Automatic Arecanut Grading System

Fig 2: Final Model (front view) |

Color, geometric and texture features are often used to analyze the quality of images in image processing [3]. The arecanut loader system is used for feeding arecanut into the system. We use Raspberry Pi which is interfaced with a webcam for image sensing and processing. The image of the arecanuts is captured and processed. Based on the extracted features of arecanuts, they are classified. A mechanical separator is used to segregate he arecanuts depending on the classification data

Fig 3: Final Model (Side view)

8	**Results and Conclusions:** The system processes the image in the micro-computer and determines the type of arecanut from the input image captured from the interfaced camera. This system provides improved quality control with reduced errors and thus reduces the requirement of skilled man power.The implemented system is also tested with a classification accuracy of 95% and an average speed of classification 20kg per hour.
9	**Scope for future work:** Introducing multiple cameras from either side of the arecanut and simultaneous processing of these two images can increase the accuracy. The developed system will act as a launching pad for upcoming systems. This system can integrate with the De-husking machine. It can be very useful for the farmers and industries. In the real time application, segregation speed of 60kg per hour is required. For that multiple systems can be used at the same time.