Coconut Sorter project

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1. **Software part**

   In software part we are working on building a system which detects both coconuts and cracks without YOLO. As running two YOLO models (one for detecting coconuts and other for detecting cracks) simultaneously will be difficult we are trying to find an alternative using OpenCV. Doing both of them in OpenCV is also a challenge, so we are using a YOLO model to detect coconuts and then using OpenCV to detect the cracks in the coconuts.The code attached below is one we are currently trying to work with https://drive.google.com/file/d/1ZxRQ3uMPI6OJ3Ua74YgOkTQ_LbvM9L6f/view?usp=drive_link

2. **Fabrication Part**

   One of the drawbacks in the coconut sorter machine is that coconuts have to come one by one in the conveyer belt (there was no mechanism for this). So we thought of many ideas and finally arrived upon one idea that was simple to fabricate and mechanically stable. Even after validating and confirming that the idea was viable we wanted to test it before actually putting into use, so we made a prototype where we used rubber balls to simulate coconuts, the working video of the prototype is attached below. https://photos.app.goo.gl/w1TRnhRYtUhoSyzf7

3. **Orientation Issue**

   The basic working principle of the machine is that coconuts come in the conveyer belt one by one and fall on the roller pins, which then rotate the coconuts and the 360 degree view of the coconuts is captured in the camera and this data is used to validate the coconut. For this idea to work the coconuts should roll on the roller pins, as coconuts are not perfect spheres they have to come in proper orientation to roll in the roller pins , for this we initially came up with an idea in which two small rectangular pieces would be attached to the walls of the conveyer belt , one fixed directly on the wall while other one is attached to the conveyer belt with supper of a spring. We haven't finalised on this idea as of now because still there is a possibility that the spring might buckle. We are looking for better mechanisms

4. The main issue

While working in the project we went to a farm visit to understand the needs of the farmers and we got to know that there is no such thing like bigger coconuts are preferred over smaller ones in the market, dealers just buy based on the rate per kilogram. This was one of the assumptions based on which the machine was designed. The machine currently sorts coconuts based on size into small, medium and large. There is no clear industry or sector in which the machine will be required. This is an issue which we are trying to address.