iDispense

James, Nathan

My aim was to create a bulk food dispensing system that would: 1. Eliminate any perceived hygiene issues in relation to the use of bulk bin product selection. 2. Automatically dispense the quantity of a product that a customer requires. 3. Provide customers with cost information about their desired purchase quantity prior to dispensing. What I Did I designed and 3D printed a worm drive based on the Archimedes' screw to drive product out of a storage container. I formed a Wheatstone bridge with four load cells to measure the change in weight of a bin, translating the changes in voltage to changes in weight in grams. I built a stepper motor driver circuit board and interfaced this with a raspberry pi computer system. I designed and 3D printed a flywheel as part of a stall detection system to ensure any produce jams can be cleared by reversing the motor. I developed code to: • Control a stepper motor that drives the worm drive • Take readings from the load cells that form the Wheatstone bridge • Control the user interface by taking readings from the keys pressed by the customer and outputting these to the LCD screen for the customer to view • Take readings from the photo interrupter to determine if the motor is stalled or is still revolving. Outcome I have developed a system which can take user input (in the form of either weight in grams or price in dollars entry via a numeric keypad) and to automatically dispense the corresponding amount of product. Conclusion The outcome from this project is exciting in terms of demonstrating the potential of more customer orientated bulk food product selection systems.

Awards Won: