Developing an Efficient Plant Counting System Using Robotic Sensors

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Cotton is one of the most valued crops grown in the U.S. with a projected 16 million bales for the 2014/2015 period. This project focuses on plant stand accuracy during the early growing stages. Getting an exact count will influence farmers' decisions to replant, recalibrate, or fix certain sites in fields. This program could potentially save a farmer more than $250,000 if a seed per foot could be saved. To solve the problem, a robotic system was created to count cotton plants using a variety of different tools and data-collection methods. For this, a number of sensors, microcontrollers, and robotics parts were gathered and assembled. With the use of this system, farmers can save on seed expense and increase crop yield at the same time. Once the robotics part of the project was completed, a series of actual field tests were ran with an ideal crop environment. Thin PVC pipe was used to represent the stalks of plants. The robot runs parallel to rows. The final design of the system provided raw data counts over 10, 15, and 20 foot sites. After counts were recorded with the microcontrollers, it had to be copied and documented from a laptop and revised by the user. Once the user documents and reads through the data, a final plant count is given. If improvements are made over time, the system could be applied to all planting equipment for efficiency in crop stands.

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