My algorithm for gravel path following is relatively simple, requiring less than 40 lines of code. Originally, I tried to use edge detection, however I only detected blades of grass and trees. Dr. Reeves suggested I use the path’s color to create a binary image, then find the center of each row. First, I create three binary images for the red, green, and blue components of the path. I and the images to create a single binary image that is then filtered with a median filter of length 25. Once the image is filtered, the center of each row is found. A vector of x coordinates and a vector of y coordinates is created. The vectors are sorted, and then the path is plotted on the original color image.

My algorithm rarely leaves the path. However, because the output is not filtered, the plots generated are sometimes jagged. Shadows are the primary cause, as they create breaks in the detected path. Sample results are shown below.

