



Measuring Concentricity Between Parts

Inspection Challenge:

A pharmaceutical manufacturer makes medicine bottle caps with circuit boards placed inside for the sight impaired. The circuit board contains an audio file that can announce the name of the medicine. The manufacturer needed to inspect caps for concentricity dimension verification – placement of the circuit board inside the cap with a $\pm .005$ inch tolerance in order for it to operate properly. A failed alignment would render the circuit board useless.

Machine Vision Solution:

This application used DT Vision Foundry's Edge Finder Tool to locate the outer ring of the cap, the Shape Fitter Tool to find its center point, the Blob Tool to find the circuit board, and the Gauge Tool to measure the difference. The application used a 640 by 480 monochrome progressive scan camera and Data Translation's DT3152 frame grabber board to capture the image.

Result:

The Data Translation machine vision solution resulted in an automated inspection process that improved the efficiency and quality of the manufacturing process.

See images on the following pages.

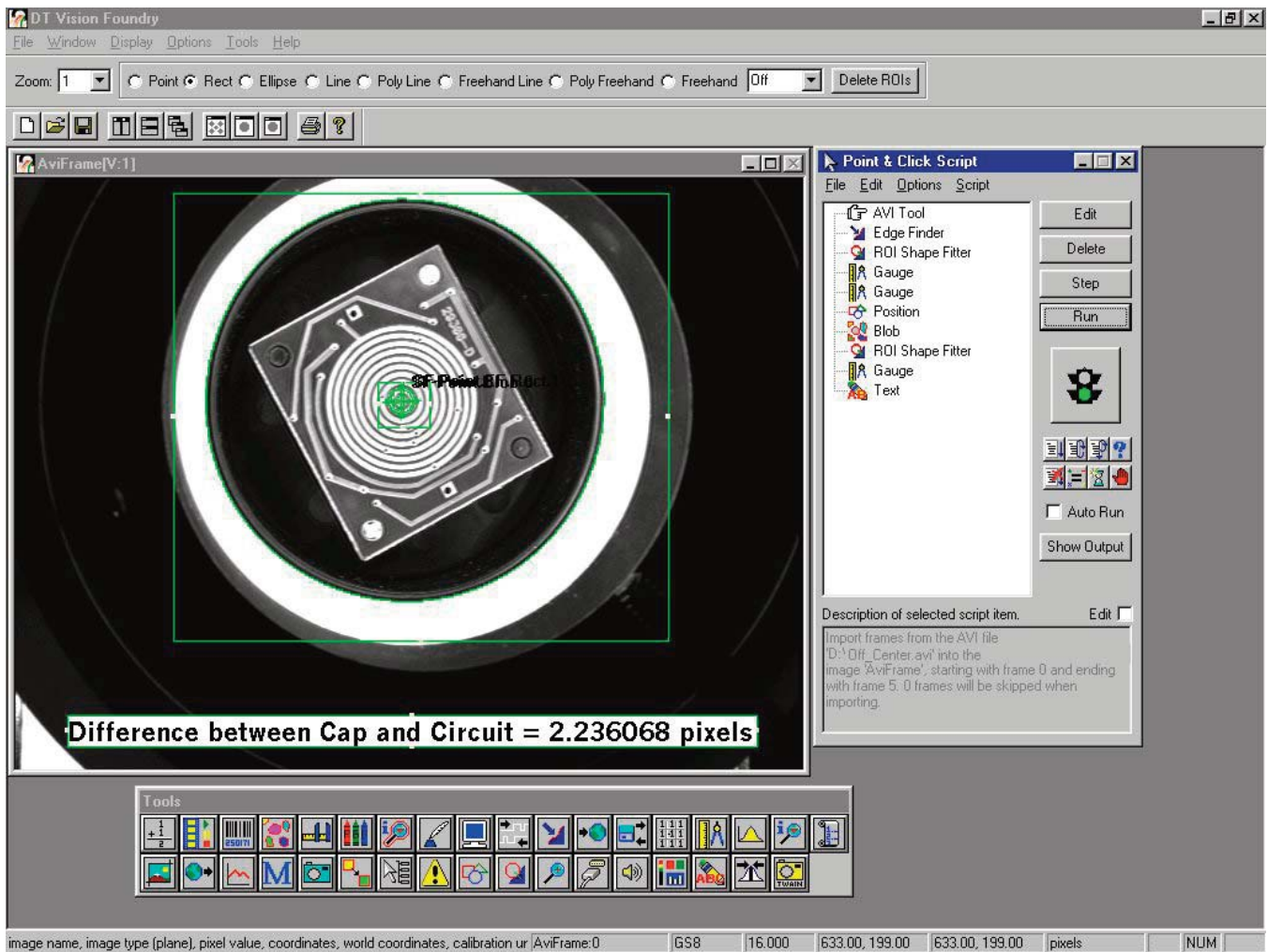


Image 1- This image shows the result of locating the center of the cap and the circuit board - the cap in this image is properly placed.

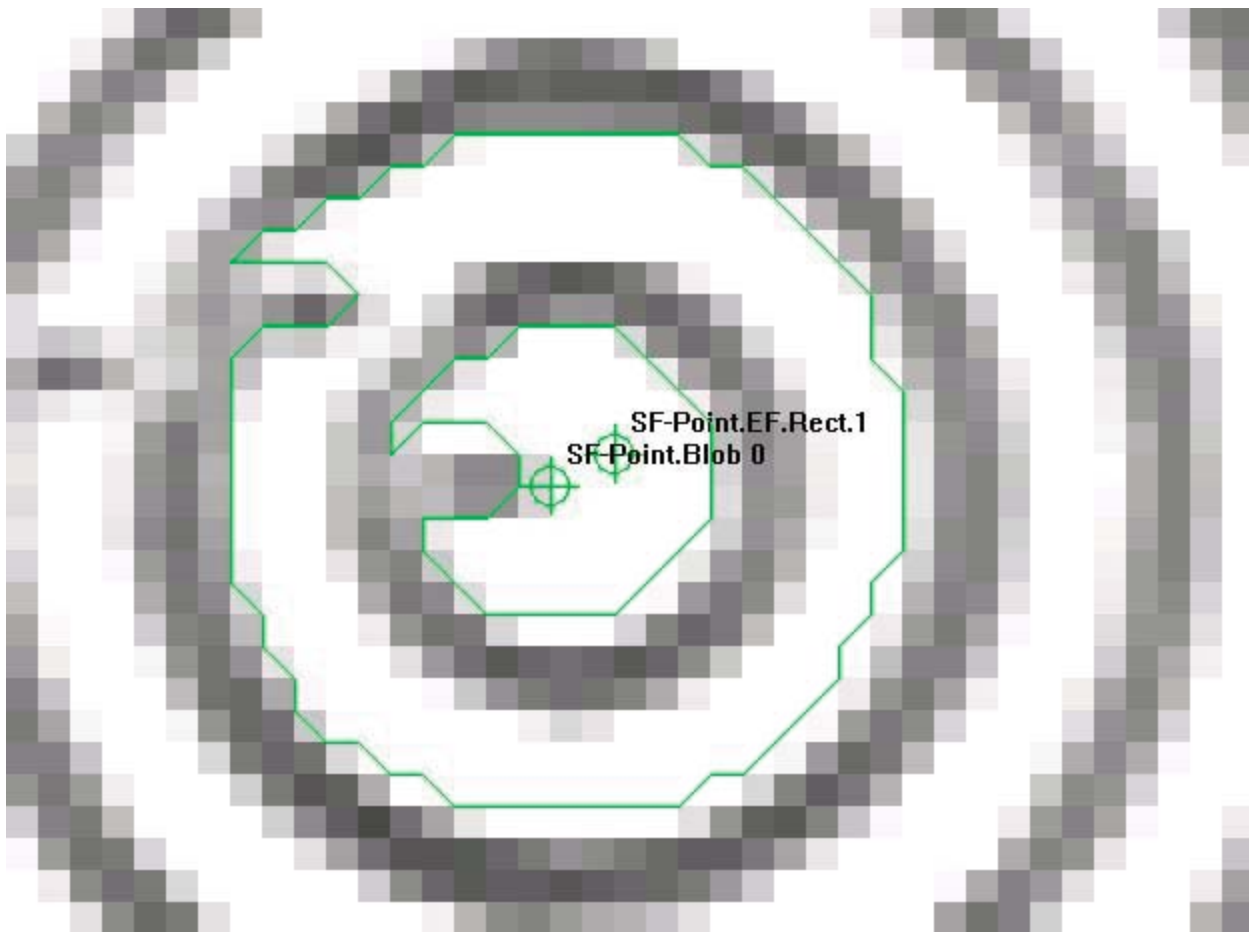


Image 2 - This shows an exploded view of the Centroids (center points) from the Cap and Ring. SF Point EF Rect 1 is the Cap Centroid (green).

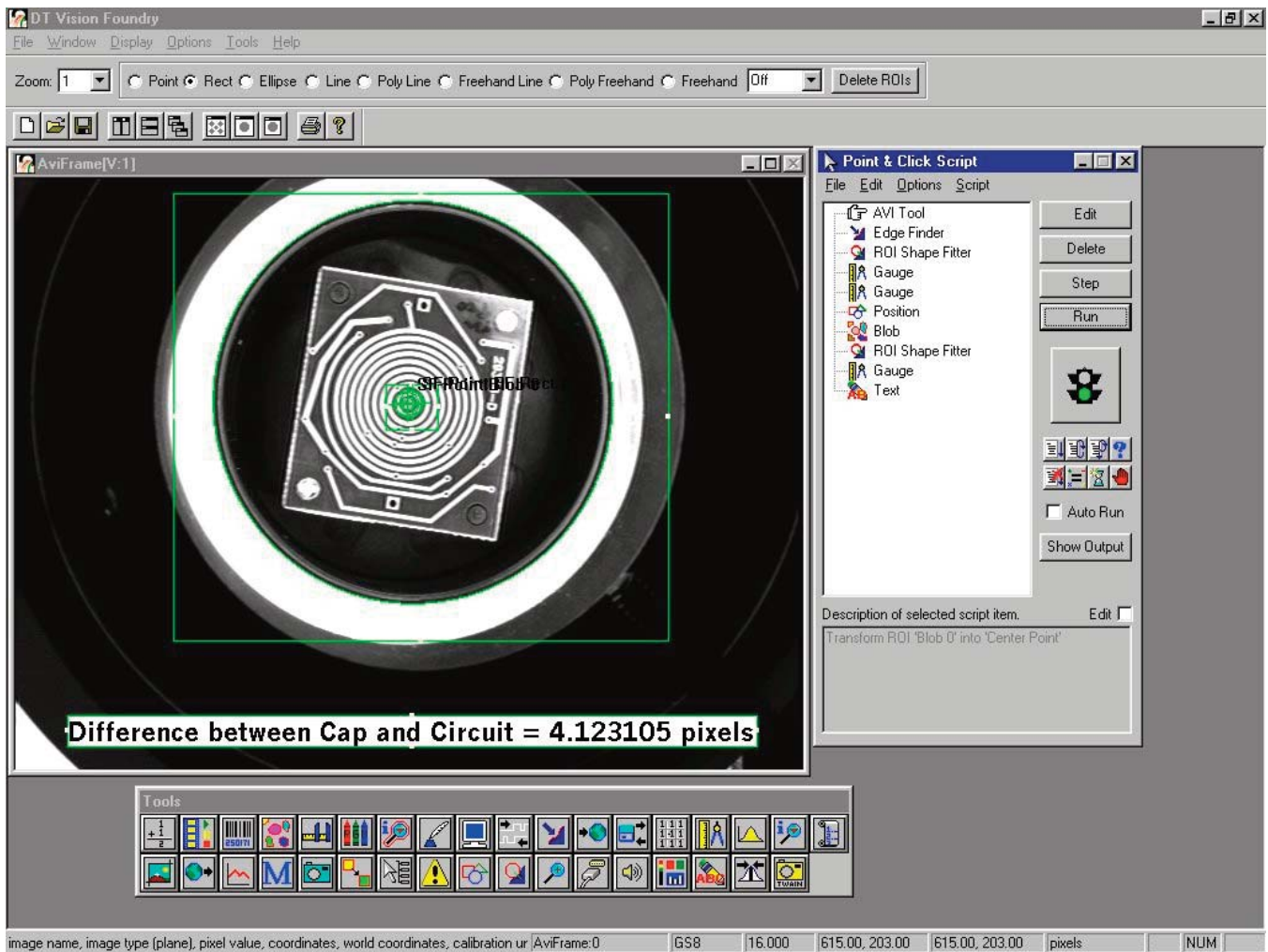


Image 3 - This image shows the result of locating the center of the cap and the circuit board - the cap in this image is improperly placed.

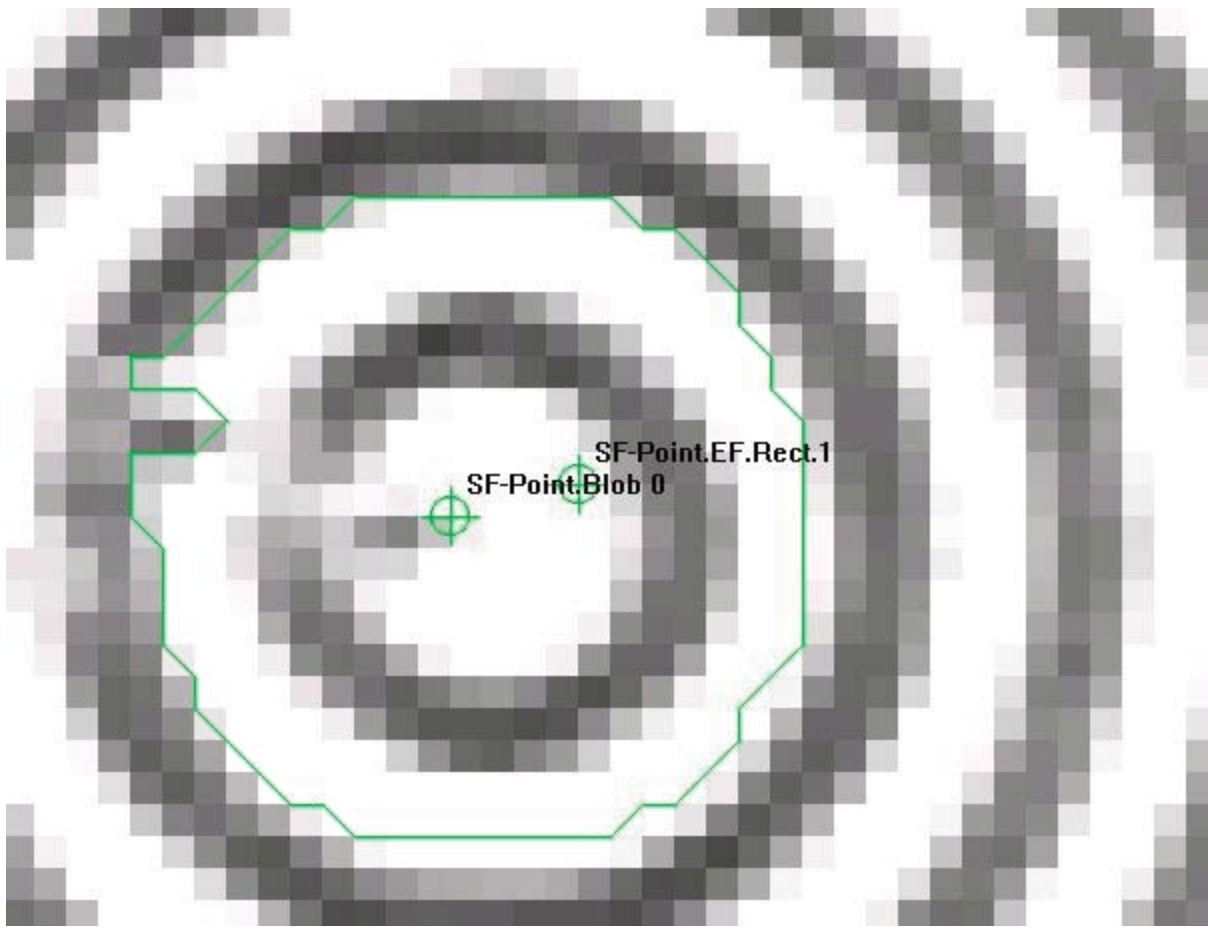


Image 4 - This shows an exploded view of the Centroids from the Cap and Ring. SF Point EF Rect 1 is the Cap Centroid (green).