

The image that comes to mind first is that of a World War II military intelligence person using a magnifying glass to study hard film photographs of enemy sites to detect potential targets or evaluate bombing damage.

As technology progressed and CCD chips were developed which allowed images to be captured digitally, in black and white at first and then in color, it became possible to conceive of replacing the human with the magnifying glass with software.

The need became pressing when photo recon from aircraft and satellites produced miles of film that had to be analyzed for targets during the cold war. The government invested heavily in target recognition software.

Many of these images were analyzed on light tables after the software pointed to potential targets. The imaging chips became high resolution and color capable. The cost plunged as chips were mass produced and film became obsolete. The software for image recognition was widely pursued for commercial products and became inexpensive and available.

One logical commercial application was to be able to identify and count pills in a pharmacy setting. Pill counting has become a large consumer of pharmacy staff time. It is a thankless, boring task that has some risks associated with it. It is a logical place to apply Pharmacy Automation.

The technique that is used is a reverse lit area (the light table) where the pills to be counted are poured out. The camera sits high over the counting area and is a fixed focal length type. All of the pills appear as black objects on a white background. Well, almost all. Pills that are translucent present a problem and may not fit this solution. Pills come in varying sizes and shapes, and they are the targets. Some machines build a library of size and shape by being trained. They are shown a pill lying flat and a pill sitting on its edge after the supply bottle bar code has been scanned to identify the drug. This library could come with the machine but would require frequent updating for new pills or reformulated pills.

The internal cameras have fairly high frame rates and new processors can run the target ID software between the frames. The pills must not overlap which requires the operator to smooth them out. Pill fragments tend to screw things up and are generally ignored. The pills are actually poured out onto a type of counting tray which sits over the light table. The tray makes it easy for the operator to return excess pills to the supply bottle, and deliver the script pills to the customer's vial.

The count is displayed on a screen and cutoff is controlled by the operator, which is not overly desirable. The need to smooth the pill pile, pills rolling around, scattered light from other sources, the use of a tray rather than pouring directly into the customers vial, all of these things slow the process of counting. On the other hand, it sure beats counting by hand as it eliminates the strain of remembering where you are in the count and is much faster.

