OEBSYS VISUAL INSPECTION SYSTREM
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NTRODUCTION

Automatic visual inspection technology developed in the mid 1970's as an outgrowth of general computer vision research.   By 1980 there were around 100 companies in the United States and a few in Europe which specialized in automatic inspection. That was followed in the mid-1980's by a period in which a number of companies failed, especially in the United States. One of the principal reasons for their failure was the unexpectedly high cost of implementing inspection systems for companies with very specialized requirements, the technology for which could not be reused easily for other applications. A second cause for failure was the high cost of inspection technology which could not be justified by the companies for which it was developed. Even companies such as Machine Vision International which had developed its own processors and morphology-based technology eventually left the marketplace.

There are a number of different dimensions for classifying inspection systems - sensor type, image type, reference model, and inspection task, and the technologies utilized for the different types of systems differ widely. Most of the inspection tasks today are 2-dimensional low-resolution inspection tasks in which the inspection system must determine whether or not a particular set of features is present in the image. A typical example of such a system would use a low-resolution video camera to acquire a 2-dimensional image of a component, determine the component location and orientation, and then determine whether the desired holes were present in the expected locations or whether a label had been attached.

The OEBSYS system addresses the particular market niche consisting of applications that require extremely high accuracy geometric measurements over large spatial areas. An attractive feature of OEBSYS is its achievement of high performance on a low cost computing platform (the PC/AT).   Even today there are not to my knowledge any other general systems of its type. OEBSYS is a binary matching system in which a workpiece is scanned by a linescan sensor, converted to a 2-level black/white image, and then compared picture element by picture element with a similar scan of a standard reference workpiece.   Binary matching technology is the oldest inspection technology, but the OEBSYS implementation combined that technology with a number of important innovations.