Notes

ML for Manufacturing article

Expert Systems – These were systems in place that required specialized knowledge such having a subject matter expert that required specific training or expertise on topic in which Machine learning was created to assist or work in place of this subject matter expert.

Details from article – Intro summary

Within the semiconductor wafer manufacturing process, tight quality control is of utmost importance. This is due to such factors as the highly competitive nature of the business [2] and the complex nature of the process itself. Therefore, it is imperative that processing prob- lems are recognized and corrected as quickly as possi- ble. To accomplish this, a Parametric Test facility ex- ists where a critical quality check is performed on the wafers. This is accomplished by measuring a number of electrical parameters at existing test sites on the wafer. Each measurement must fall within an acceptable range of values for its associated parameter to pass the crit- ical check. If test results indicate that a parameter is outside of its acceptable range, the wafer may fail the quality check and be scrapped. If this happens an ex- pert must examine all the parametric data associated with that wafer and attempt to determine the reason for failure and where in the manufacturing process the problem may have occurred. The expert's ability to diagnose these failures springs from both a knowledge of semiconductor physics and experience with the wafer manufacturing process. Since this combination of knowledge and experience is valu- able and rare, it was decided that an expert system should be designed and implemented to take the place, or at least reduce the burden, of the human expert in the area of diagnosing wafer failures. As a result, the ADEPT expert system was created through the combined efforts of professors and graduate students in the Computer Science Department at the University of South Florida, in Tampa, Florida and process and de- velopment engineers at Harris Semiconductor, in Pahn Bay, Florida. This expert system was deployed in Au- gust 1989 using a SUN 3/60 workstation.