

Development of Automatic Laser Scanning Measurement Instrument

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Abstract : This study used triangular laser probe and three-axial direction mobile platform for surface measurement, programmed it and applied it to real-time analytic statistics of different measured data. This structure was used to design a system integration program: using triangular laser probe for scattering or reflection non-contact measurement, transferring the captured signals to the computer through RS-232, and using RS-485 to control the three-axis platform for a wide range of measurement. The data captured by the laser probe are formed into a 3D surface. This study constructed an optical measurement application program in the concept of visual programming language. First, the signals are transmitted to the computer through RS-232/RS-485, and then the signals are stored and recorded in graphic interface timely. This programming concept analyzes various messages, and makes proper presentation graphs and data processing to provide the users with friendly graphic interfaces and data processing state monitoring, and identifies whether the present data are normal in graphic concept. The major functions of the measurement system developed by this study are thickness measurement, SPC, surface smoothness analysis, and analytical calculation of trend line. A result report can be made and printed promptly. This study measured different heights and surfaces successfully, performed on-line data analysis and processing effectively, and developed a man-machine interface for users to operate.

Keywords : laser probe, non-contact measurement, triangulation measurement principle, statistical process control, labVIEW

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