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**DSP BASED CONTOURING
WITH DC MOTORS**

By

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Thesis

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Abstract

In a metal sheet cutting system, various profiles of metal sheets are cut using an oxy-acetylene gas flame cutter, in a commercial base in Colombo. This industrial cutter we studied for modifications was a gas flame cutter which is driven by two DC-motors. First the required profile is drawn on a paper in one to one scale. Then a camera is allowed to follow the profile on the paper and reference data are provided accordingly to two DC motors which then move the cutter in X and Y directions. This method of controlling has raised some practical problems. Few of them are manual handling of drawings in large sizes and following various unintended paths by the camera causing various difficulties. Therefore, in our study a PC based system is proposed. In this system the required profile is drawn in a PC in AUTOCAD software and saved in DXF (Drawing Exchange File) format. Then by means of optimizing techniques the profile drawn in the PC is transformed to a series of X and Y coordinates that digital controllers can understand. In order to drive the flame cutter in X and Y directions two DSP processor based position controllers and two DC motors are used. The transformed new data in the PC are fed into two separate X and Y position controllers which drive the two DC motors in X and Y directions. The proposed control system gives better dynamic and steady state performance which can be applied satisfactorily to the flame cutter system. This system will basically eliminate the difficulties mentioned above and would result in an improved reliable and user-friendly system.