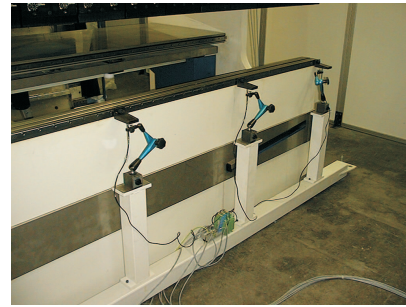




Bending machine



Deformation measurement

Compensation of deformations at bending machines

Determination of a fuzzy controller out of measured data

When bending sheet metals deformations occur at the bending machine, leading to inaccuracies at the bending edge of the sheet metal, i.e. the bending angle varies along the edge of the work piece. So far this problem could only be solved by a firmer machine construction, adjustment of the table and by manual skew of the bending bar.

Goal of the project

Sensors are taking up data during the bending process. With this information and the specifications of the sheet metal the position of the bending center should be determined using a fuzzy system. With the previously calculated position and the constantly measured data the necessary skew of the bending bar should be set automatically.

The Task

The position detection and compensation of the occurring deformations has to be integrated as a software module into the existing controlling system. Similar accuracy as with a manual skew setting of the bending bar should be achieved for different thickness, length and materials of sheet metal.

Solution

Because of the difficulty obtaining a physical description of the behavior of the bending machine the model is purely based on measured data, from which a mathematical model could be derived.

To the determinate the bending position, a fuzzy controller, which is created automatically by a clustering optimization method, is in use. For the compensation of the deformations an off-line model has been derived on the basis of empirical values and measured data. Using these model the actual deformation of the bending machine is computed, from which finally the correction values for the skewness of the bending bar can be determined.

Partners

- TRUMPF (Linz Pasching)
- UNI SOFTWARE PLUS GmbH (Hagenberg)

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