

Master Thesis

For: Shaheera Mah E Muneer

Theme: An Algorithm for the consistency analysis of engineering drawings for standard working instructions creation

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1) BACKGROUND

The creation of standard working instructions is mainly based on engineering drawings. Very often these drawings vary in detail concerning additional holes, fittings, etc. For the creation a consistent description of all necessary tasks is required. For this purpose. Engineering drawings of the same or similar topics need to be analysed to find out differences and deviations, which need to be identified and collected for a consistent description. Within this thesis an algorithm shall be developed which allows for the analysis and identification of those differences based on the identification of new objects.

2) PROJECT

The scope of this project is to implement an algorithm to automate the process of analysing 2D drawing sets variants and creating standard working instructions for that region. Currently, the analysis is done manually either by manufacturing engineers or by assembly personnel which leads to certain non-conformities and hence increases manufacturing lead time. The scope of this Master thesis includes developing and implementing image processing techniques to find the delta between drawing set variants and applying machine learning algorithms to recognize those features. The algorithm should be able to work with different file format (i.e. Pdfs, tiff) to be more generic. The thesis will focus on specific used case "Missing drilling holes" which could then be adapted to other primary structure components in future. Results of this work shall be compared to the existing manual as-is output.

In particular the following tasks shall be performed

- Literature review: understanding current Manufacturing Rules.
- Data analysis: analyzing input data set.
- Algorithm definition (to-be solution).
- Implementation of the mathematical model using C#.
- Verification and validation of the mathematical model using example SOIs.

- Thesis documentation including results, critical discussion and conclusions.

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External Supervisor: Dr. Jens Immohr, Umlaut Engineering GmbH

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Date, signature of 1. examiner:



Date, signature of external supervisor:

Date, signature of student:



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