

Modelling component tolerances for paper path designs

Océ (www.oce.com) is a world-leading developer of high quality production printers. Such production printers print several hundred thousands of pages per day. Typical applications include on-demand printing of books (e.g. for Amazon, bol.com) and transaction printing (e.g. for credit-card companies, retirement funds). The behaviour of a production printer emerges from the interaction of complex physical and mechanical aspects.

The aim of this project is to include the tolerances of (transportation) components such as pinches, switches and belts into an existing optimization model [1]. The model optimizes the paper path lengths and timing profiles for particular sequences of sheets through a direct transcription model.

The duplex loop in the printer (Figure 1) is more than 10 meters long and various requirements on the distance between sheets lead to complicated paper scheduling behaviour.



Figure 1: Production printer with large duplex loop

Project description

This project will be executed at *Océ Technologies BV in Venlo* and can start at any moment. We expect you to do the following:

- Study the existing optimization model
- Interview domain experts on the type of errors and tolerances to be modelled
- Integrate some of these errors into the existing model
- Verify the abstract models' accuracy

Skills and knowledge

- Modelling, optimization and basic programming experience (MATLAB)
- Affinity with (non-)linear optimization and direct transcription of models.

If you are interested in this topic for a Master project, please contact dr. ir. Michel Reniers (m.a.reniers@tue.nl) or dr. Lou Somers (lou.somers@oce.com) for more information.

References

- [1] L. Swartjes, "Model-based Constrained Optimization for Paper Path Layout and Timing Design of Printers".