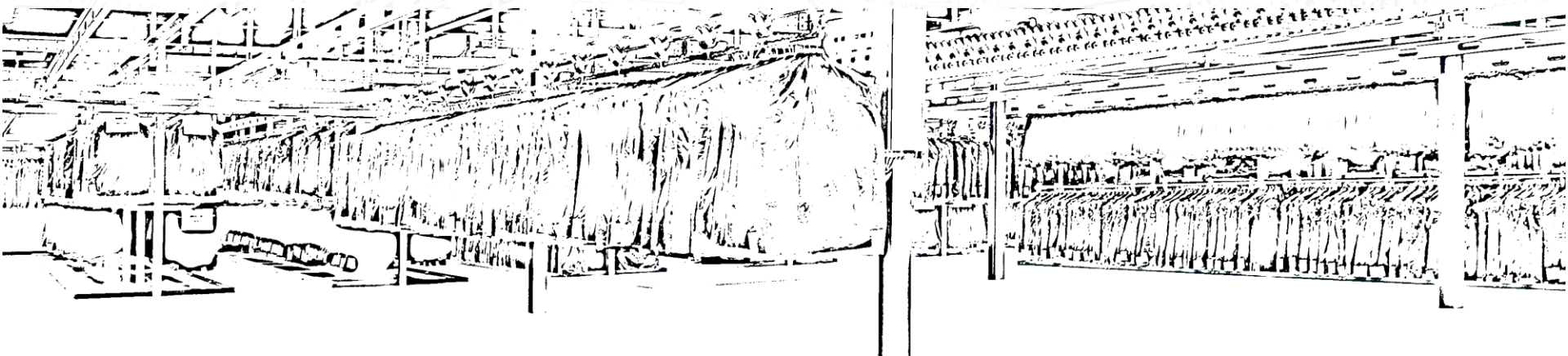




SCHÖNENBERGER

Interdisciplinary project

Optimization & development of efficient sorting algorithms





SCHÖNENBERGER

Who we are; our area of expertise:

Schönenberger Systems is the SPECIALIST FOR CUSTOMIZED INTRALOGISTICS AND TRANSPORT SYSTEMS based on overhead conveyor systems.

In over 40 years Schönenberger offers it's innovative solution to a wide spectrum of industries, mainly focused on automotive, apparel logistics, e-commerce stores and laundries. Our customers profit from our extensive experience and wide-range solution expertise.

Our focus of overhead conveyor systems is for production and warehouse operations and as well for facilities for just-in-sequence production.

Core competencies are customized solutions in the field of load carriers, warehouse control systems and individualized sorting algorithms.

www.schoenenberger-systems.com

We are offering:

- Insights into an innovative typical German medium-sized company
- Coaching and mentoring during the IDP
- Open atmosphere which gives you the possibilities to think out of the box
- Close collaboration with project managers to evaluate optimization approach on industrial cases



• Project back round / topic:

Consumer behavior has changed dramatically in the past decade. E-commerce is booming and the opportunity to have everything in every quantity always available has influenced consumer behavior.

Schönenberger as lead supplier for the e-commerce business has to react on these continuously changing parameters and dynamic environment.

An installation has to be generalized and customized on the same time to react on changing order characteristics.

Schönenberger integrated innovative **sorting principles & algorithms** in the current layout designs to tackle the requirements of our customers. We are capable to achieve all current requirements of our customers, the fast-changing environment and requirements of our customers faces us to develop and **verify new algorithms**, which combines existing and new sorting principles in the area of e-commerce.

Schönenberger aim of the project is to develop and evaluate new sorting algorithms to increase the efficiency of sorting in the e-commerce environment.

Project procedure:

- Identify relevant state and control variables for the sorting operation
- Conduct a literature review of sorting algorithms including key criteria like running time, complexity, solution space
- Develop an optimization model using the improved sorting algorithm (integrate the identified state and control variables)
- Implement the mathematical model in an appropriate modelling environment, e.g. Python, C++
- Verify the performance of your algorithm based on a simulation model with existing data and different scenarios (Implement your simulation model in Automod)
- Document your development and results in a written report and present it to the supervisors and top Management of Schönenberger



Prerequisites:

In accordance with the practical assignment, it's mandatory that you have participated already in the course IN0007: „Grundlagen: Algorithmen und Datenstrukturen“ (https://ciip.in.tum.de/teaching/gad_ss20.html) by the chair of Computational Imaging and Inverse Problems. Beneficial is your participation in the course “Complex Scheduling In Manufacturing and Services: Models, Methods and Applications” offered by the Operations Management chair.

Project language can be English or German, German is not mandatory, but highly welcome. Your programming and communications skills should be very good.

Project timeline:

The IDP is scheduled to take place in the summersemester (SS2020) and usually lasts about three months. Please send your application prematurely to the contact persons listed below.

Contact:

Please submit informative documents (CV, transcript of records, certificates, ...) about yourself to the following contact persons (please send to both persons):

- Martin Völkel (m.voelkel@schoenenberger.de)
- Mario Drischel (m.drischel@schoenenberger.de)

Schönenberger is looking forward to your application.