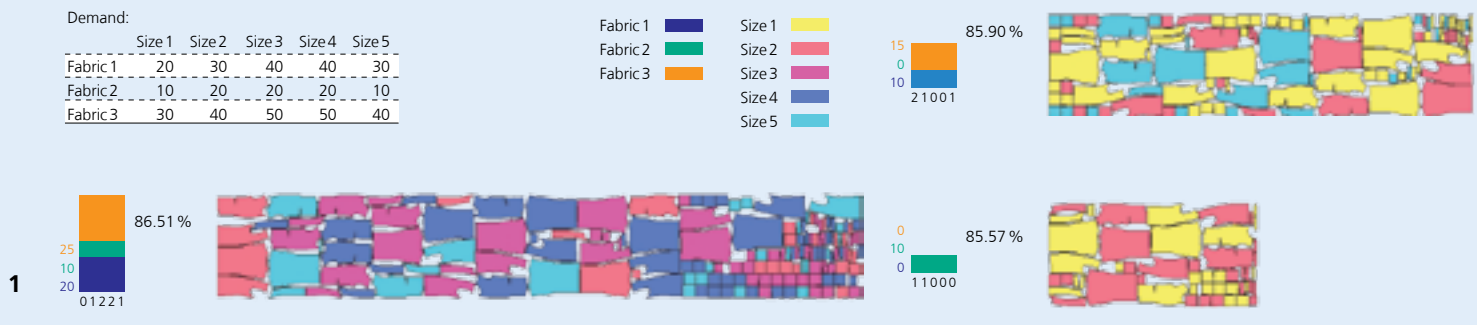




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1 Example: Calculation using exact mode, resulting in a total yield of 86.33%, calculation time: 20 minutes.

AUTOMATIC CUT ORDER PLANNING IN TEXTILE INDUSTRY

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Software package CutPlanner

CutPlanner is a software package for use in the textile manufacturing industry for automatic cut order planning.

CutPlanner takes a customer's order for a clothing item and creates a cut plan for that item, including different sizes and different fabric types or colors, which minimizes production costs.

A cut plan is an assignment of sizes and fabric types to markers. For each of these markers, the required number of plies is computed to fulfil the order's specifics.

The objective of CutPlanner is to minimize total production costs. They consist of the costs for the fabric used, and several production costs incurred by making the markers, preparation of the cutting process, and the picking of pieces to be cut.

CutPlanner provides two different modes of operation to calculate material consumption:

1. Conventional mode:

The user dictates the estimated yield values that specify the material consumption, which depends on the number of sizes in a marker.

2. Exact mode:

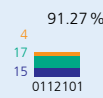
CutPlanner engages an integrated automatic marker making engine to calculate the real material consumption. Here, the user does not have to supply any estimations: the software runs automatically.

There is a trade-off between speed and accuracy. In conventional mode, the computed costs are only estimations, but a solution is reached very quickly.



Demand:

	Size 1	Size 2	Size 3	Size 4	Size 5	Size 6	Size 7
Fabric 1	51	74	74	97	74	51	15
Fabric 2	19	36	44	61	44	43	23
Fabric 3	12	18	26	32	26	12	4



Fabric 1
Fabric 2
Fabric 3

Size 1
Size 2
Size 3
Size 4
Size 5
Size 6
Size 7

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In exact mode, the computation of a solution takes more time, but real costs are used for its calculation. In other words, the solution in exact mode is closer to the real outcome.

If the yield data for some or all markers is already available for the user, this information can be given to CutPlanner. Consequently, the computation time decreases because these markers do not have to be nested during the computations. Furthermore, already existing solutions can be given to CutPlanner, in order to be improved by the software.

Methods

CutPlanner combines the latest optimization techniques in order to achieve the best results in a very short time. CutPlanner utilizes linear programming techniques specialized for large problems, which are adapted to the special problem characteristics of cut order planning.

To expand upon these strategies, fast local search algorithms, pattern recognition techniques, and effective heuristics are also employed.

Additionally, dynamic parameter choices are used in all cases.

CutPlanner uses advanced technology for integration of nesting software allowing fast and accurate cost estimations.

Software

CutPlanner addresses developers of CAD- and ERP-systems for the textile manufacturing industry. The software package is organized as a software library (DLL) and can be seamlessly integrated into other software environments and GUIs by the developers of such systems.

Fraunhofer SCAI also offers the creation of custom-made stand-alone applications for the end user that can be used to create solutions from special data formats.

We recommend installing the software on a fast PC with at least 1 GB of RAM. The software is available for Windows operating systems, other operating systems may be supported on request.

For more information including detailed product documentation, examples, and a user's manual of CutPlanner, please consult the Fraunhofer SCAI website or contact us directly.

Further information about CutPlanner:
www.scai.fraunhofer.de/cutplanner

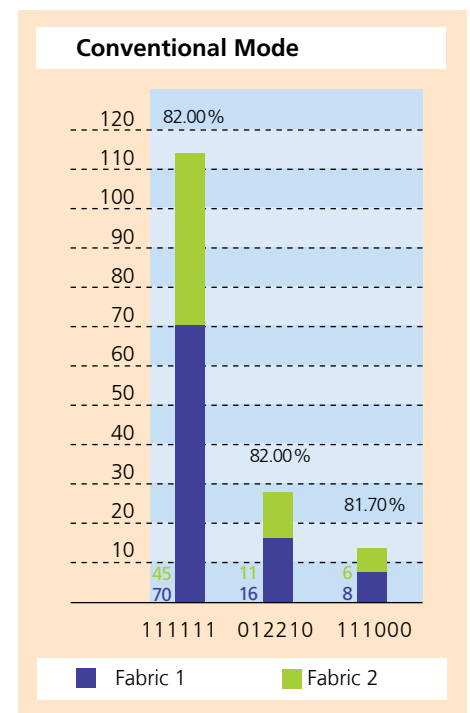
Examples

The given examples were computed using CutPlanner on a standard PC with a 3 GHz processor. The different colors of the pieces in the markers represent the different item sizes.

Example 1: Calculation using exact mode, resulting in a total yield of 86.33 %; calculation time: 20 minutes

Example 2: Calculation using exact mode, resulting in a total yield of 91.44 %; calculation time: 30 minutes

Example 3: Calculation using conventional mode, resulting in a total yield of 81.99 %; Calculation time: < 1 minute



Demand:

	Size 1	Size 2	Size 3	Size 4	Size 5	Size 6
Fabric 1	78	94	110	102	86	70
Fabric 2	51	62	73	67	56	45

Yield Table:

one size	81.00 %	four sizes	81.80 %
two sizes	81.50 %	five sizes	81.90 %
three sizes	81.70 %	six sizes	82.00 %

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