AutoNester-T
For automatic marker making

AutoNester-T is a software package for automatic placing of patterns on fabrics. It is widely used in the garment and upholstery manufacturing industry. It is able to nest any set of pieces within a very short time in an optimal way, minimizing wasted material, while taking into account various types of constraints. The efficiency of the markers achieved by AutoNester-T is competitive to experienced human nesters.

The AutoNester-T software is organized as a Dynamic Link Library (DLL) to be used as a developer's tool kit. Developers of CAD-systems can integrate AutoNester-T into their software. We also offer the creation of custom-made standalone applications for the end user which can be used to create markers from special data formats.

AutoNester-T is constantly improved and more and more kinds of constraints are incorporated.

Currently, the following constraints are supported

- Stripe and plaid
- Pre-placed pieces
- Folded and mirrored pieces
- Folded markers
- Nap and flip restrictions
- Bundle support
- Rotation adjustable
- Tilt support
- Splitted pieces
- Dynamic half piece sharing
- Holes and defects in the fabric
- Splice marks
- Goal efficiency
- Time limits
- Unrestricted number of pieces
- Finite sheet nesting

Top: T-Shirts, 102 pieces, efficiency 89,0%, 1 minute. Bottom: Sofa, 62 pieces, efficiency 93.8%, 1 minute

Methods

AutoNester-T combines many of the latest optimization techniques in order to achieve the best results in a very short time. We use local search algorithms based on new variants of Simulated Annealing, multiply iterated greedy strategies, paired with efficient heuristics, pattern recognition techniques and fast Minkowski sum calculators. In the local search algorithms, we use fully dynamic statistical cooling schedules and dynamic parameter choice. For the calculation of optimality proofs and efficiency guarantees on markers we use a combination of branch-and-bound algorithms and linear programming.

Software

The AutoNester-T software package for automatic placing of patterns on fabric can be used via an application programming interface (API). The software package addresses developers of CAD-systems for the textile manufacturing industry and industries with compatible packing problems. CAD-system developers can easily integrate AutoNester-T into their own CAD-software. On request, we also build tailormade standalone applications for our customers which are based on the AutoNester-T kernel.

AutoNester-T is available for all Microsoft-Windows-PC-Operation systems. More information and a detailed product description of AutoNester-T can be found on the Fraunhofer SCAI website.

Examples

The markers shown on this sheet have been calculated by the AutoNester-T software package. All runtimes refer to a standard PC. The colors of the pieces mark different bundles.
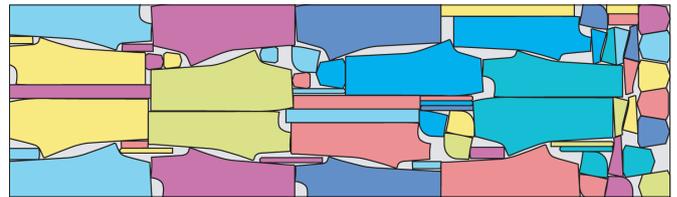
Trousers, 64 pieces, efficiency 89.1%, 1 minute
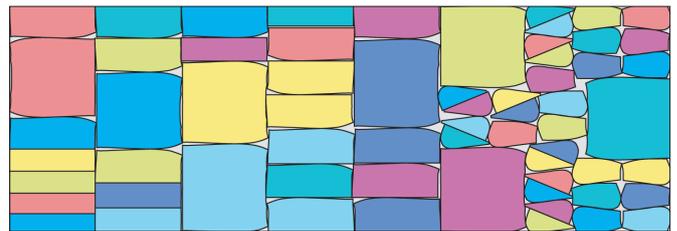
Skirts, 64 pieces, efficiency 94.3%, 1 minute
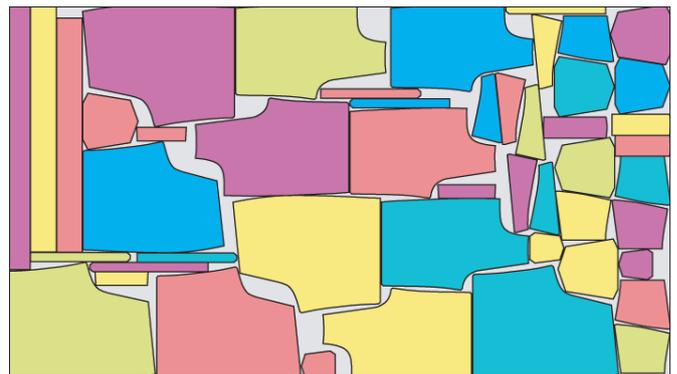
Shorts, 48 pieces, efficiency 88.4%, half a minute

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