



# AM Build Job Nesting Optimizer

Enabling Industries Through Innovative Algorithms for Production Planning

## Motivation and Relevance

- State of the art nesting algorithms have insufficient performance to perform online optimization of AM production build job queues
- Advanced nesting algorithms enable AM service providers to rapidly adapt to new orders and dynamically optimize production planning and nesting

## Approach

- Rethink AM job preparation with a new dynamic collision resolution algorithm based on No-Fit Polygons
- Governed by a genetic optimization algorithm, rapidly find optimal packing solutions under the current due date and machine capacity constraints

## Results

- Showcase benchmark results  
**2801 parts/s nested** z-height reduction **25 mm**
- first solution after **49.4s** **30.21%** volume density
- shown solution **27:31 min** **31.70%** volume density

## Research Area

- AM Software
- Production planning

## Features

- Integrated disassembly simulation prevents part interlocking
- Supports non-manifold meshes
- Automatically processes complex geometries, including lattices and support structures

## Picture

Benchmark 'Prusa Mini x100' with 25 models, 6100 instances  
Hardware: AMD Ryzen 7950X3D, 16 cores, 64GB RAM



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