A SENSOR SKID FOR PRECISE
3D MODELING OF PRODUCTION LINES

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Objective & Challenge

- Increasing need of rapid characterization of environments in 3D like factories
- Yield high accurate 3D point clouds
- Digitalization without stopping the production
- Transfer the idea of mobile mapping to interiors
- Exploit existing conveyor belts for kinematic lasercanning
- Use no global references nor expensive IMUs
- Provide an efficient collision check with a CAD model moved along a trajectory

Approach

- Move a sensor skid (work-holding fixture) with a continuously spinning laser scanner through the factory
- Semi-Rigid SLAM (1) for deforming the trajectory

Results

- High precise 3D model
- Comparison with terrestrial 3D scanning
- Computation collisions using a fast k-d tree (2) and heuristic for depth of penetration

Future Work

- Improving the efficiency of the computation
- Enhancing the calculation of depth of penetration to regard that scanners gage surfaces
- Implement data acquisition for more scanners
- Ground truth analysis

References
