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From Zero to Hero: Developing a Probabilistic Analyzer for Manufacturing Processes with Bayesian Networks

Tuesday, 17 September 2024 12:00 (30 minutes)

Manufacturing processes are systems composed of multiple stages that transform input materials into final products. Drawing inferences about the behavior of these systems for decision-making requires building statistical models that can define the flow from input to output. In the simplest scenario, we can model the entire process as a single-stage relationship from input to output. In the most complex scenario, we need to build a model that accounts for all existing connections across the stages of the process, where each stage may contain a number of controllable parameters and evidence variables. In this work, we will explore the different data science elements behind modeling manufacturing processes using Bayesian networks. Through this, we will demonstrate how to build a model for a manufacturing process, starting from the simplest form and progressing to a more realistic and complex system definition, using a recycling process as our driving case study. We will deploy this model to show how it ultimately provides the inferences we aim to draw about the behavior of our manufacturing processes

Type of presentation

Talk

Classification

Both methodology and application

Keywords

bayesian networks, causal modeling, manufacturing process

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