



Deutsche Post Lehrstuhl  
für Optimierung von  
Distributionsnetzwerken

**RWTH**AACHEN  
UNIVERSITY

## Master Thesis

### Using a Machine-learning Approach to Estimate the Number of Stages for a Rolling-horizon Procedure in Multistage Stochastic Programming

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#### Our chair

Our chair is devoted to the development and implementation of decision support systems for solving and analyzing planning problems in logistics and production, especially transportation, network design, location planning, warehouse management and workforce scheduling problems. The methodological focus lies on mathematical modeling, exact and heuristics optimization, and machine learning techniques. Our intensive collaboration with Deutsche Post DHL and other industry partners provides a strong application focus for many of our projects.

#### Your task

Multistage Stochastic Programming (MSP) is a class of decision-making models for sequential decision-making under uncertainty. MSP problems are known for their computational difficulties, and one common workaround for these difficulties is the rolling-horizon procedure. The rolling-horizon procedure is a method that involves solving a sequence of MSP problems that are defined with a smaller number of stages than the original MSP. Although reducing the number of stages makes the computation more tractable, it compromises the solution quality. This leads to the important question of how many stages to use for each problem in the rolling-horizon procedure. The goal of this thesis is to use a machine-learning approach to address this question.

#### Your profile

- Good knowledge of linear programming and duality
- Good knowledge of English and programming skills
- Reliable, independent and motivated way of working
- Conscientious and structured approach to work

If you are interested, please feel free to write an email with your CV and your transcript of records to Murwan Siddig (siddig@dpo.rwth-aachen.de).