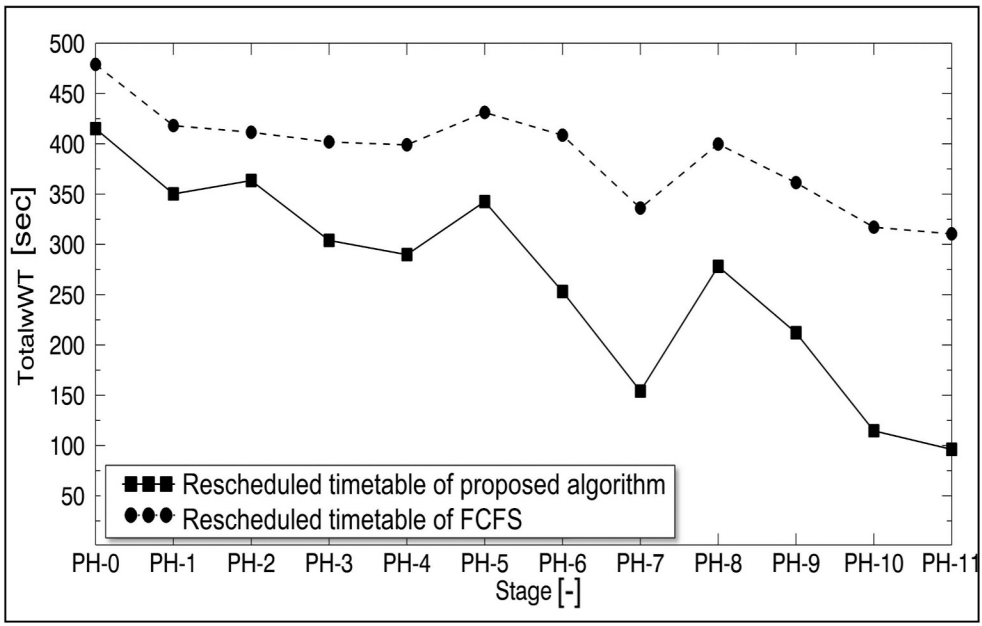
Hybrid Model for Proactive Dispatching of Railway Operation under the Consideration of Random Disturbances in Dynamic Circumstances



Weiting Zhao

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Hybrid Model for Proactive Dispatching of Railway Operation under the Consideration of Random Disturbances in Dynamic Circumstances

Von der Fakultät Bau- und Umweltingenieurwissenschaften der Universität Stuttgart
zur Erlangung der Würde einer Doktor-Ingenieurin (Dr.-Ing.)
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Preface

Railway operations are regularly subject to stochastic influences that cannot always be compensated for by the recovery times and buffer times contained in the timetable, and can thus result in passenger delays. For this reason, railway dispatching is of particular importance because it helps to ensure on-time railway operations.

The most significant result of this dissertation is a realistic dispatching algorithm that can be used in both real-life applications and railway simulations. The algorithm is able to generate dispatching solutions under consideration of stochastic disturbances with consideration of different risk levels of the individual elements of train paths or infrastructure elements; the risk levels are quantified using the negative influences caused by the operational disturbances. The knowledge gained in this dissertation on the modeling and methodical development of a dispatching algorithm is a significant scientific contribution to the efficient management of railway operations in practice and in railway operation simulations directly relevant to practical implementation.

Stuttgart, September 2017

Ullrich Martin

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