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Punctuality modelling and forecasting: Frankfurt Airport case study

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The subject of this study is to better understand and quantify the weather impact on air traffic delays. Using Frankfurt Airport as study airport, it is examplarily shown, how much of the variability in daily punctuality can be explained through application of a hybrid mathematical model. It is shown, that an R^2 exceeding 0.6 can be realised. More than 45% of the variability in daily punctuality can be explained with local weather, only. Thus, the strong weather impact on air traffic delays is impressively verified.
In a second approach, the developed punctuality model was analysed focussing on its potential for punctuality forecasting. It is shown that good modelling results can be achieved using predictable input variables, only. By means of independent data, an R^2 of almost 0.6 was realised. Based on these results, the operational application of a punctuality model seems not only possible but also meaningful.