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## Generalized Bühlmann-Straub credibility theory for correlated data

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## Abstract

In this thesis, we first go through classical results from the field of credibility theory. One of the most well-known models in the field is the Bühlmann-Straub model. The model is relatively straightforward to apply in practice and is widely used. A major advantage of the model is its simplicity and intuitive dependency on its model parameters. From our perspective, the main drawback is the assumption regarding uncorrelated data. We show that the correlation can be used to cancel observational noise and therefore obtain more accurate estimators. This leads to an extended credibility formula that contains the Bühlmann-Straub model as a special case. This comes at the cost of introducing singularities which may cause the estimators to behave unexpectedly under certain circumstances. Further research is needed to better understand how often the circumstances are met in practice and if transforming the optimal weights could be a way forward in such cases. Finally, through a simulation study based on real-world data, it is shown that the proposed model outperforms the Bühlmann-Straub model.

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