ABSTRACT

In the industry, categorical, numeric discrete and non-controllable inputs occur which can not be applied to Bayesian Optimization. But in order to apply this method in industry, this thesis describes extending methods for modelling categorical, numeric discrete and non-controllable inputs. Therefore, one method for each non-conventional attribute was worked out in order to extend the Bayesian Optimization by them. Furthermore, the investigated extensions were combined to test their functionality in combination. This was done by applying the extensions to simulated functions. Additionally to noise-free data, some examples were applied to functions with noisy observations in order to show how both data are modelled. Because noise in industry is a known problem, this investigation is a relevant one. For numeric discrete as well as non-controllable inputs, effective solutions were found. However, the selected solution for categorical values performed also good, but depends strongly on initial weights which were set randomly. So this method needs to be improved. Finally, the Bayesian Optimization was extended by all three methods and applied to the three inputs categorical, numeric discrete and non-controllable. It was shown, that the problems the Bayesian Optimization has in dealing with the selected non-conventional data can perform good.