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Future works

The approach proposed in this thesis allowed us to find promising results considering the uncertainty and acquisition of information. Here we enumerate some studies and methodology improvements that can be done in future works.

A detailed investigation can be done in order to identify vulnerable point of the proposed approach, and then propose some solutions for it. In this context we can enumerate the way that the reducing uncertainty is done, that nowadays is based on clustering algorithms that are not deterministic, and the need of previously define the decision resolution that will be used, leading the approach how much information we need to gain to make necessary change the flow control strategy.

We could note that the number of evaluation required by the proposed approach can be large, so studies about methodology improvements to reduce the computational cost are welcome. Moreover, since this approach can use any optimizer to find the optimum settings, we could investigate other optimization methods applied for expensive to evaluate functions.

So, based on the influence of oil price at the time to make decisions, as future works, we propose an investigation about how to include economic uncertainty in this approach, without to increase so much the number of evaluation required.

We also proposed to apply this approach to other reservoir models, especially on cases where the water or gas production cannot be fully produced, considering capacity constraints and high costs associated. We are very interesting on this kind of case, because this is similar to pre-Salt condition, since this huge field in Brazil has attracted many investments over the last few years.

The proposed approach also can be applied to value operational flexibility more generally, for other technologies/processes in the oil and gas industry and beyond. We could, for example, value the flexibility on the production system to be used on platforms, considering the flexibility to drill new wells and/or conversion of producer wells to injectors at some point in the time horizon, all while considering the geological uncertainty and platform capacity constraints.